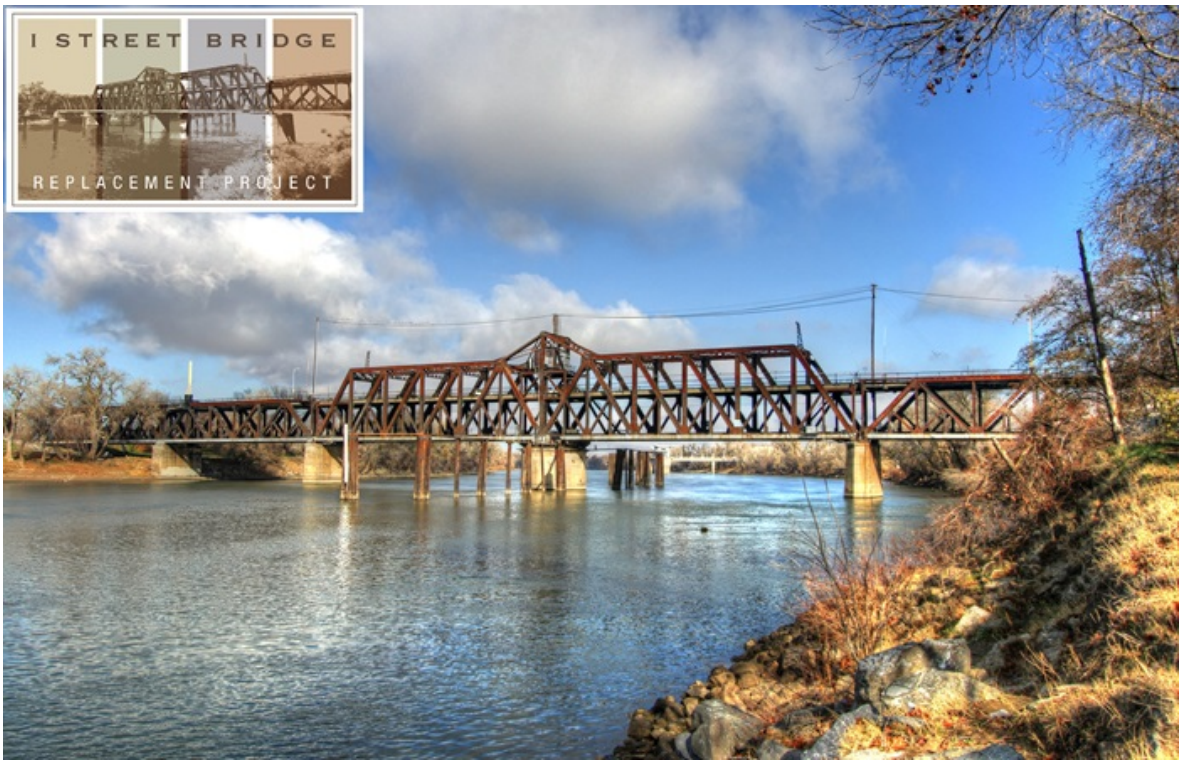

Water Quality Assessment Report

I Street Bridge Replacement Project

Sacramento and Yolo Counties

Federal Project No.: BRLS 5002(164)

February 2016

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Water Quality Assessment Report

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Executive Summary

This Water Quality Assessment Report (WQAR) provides information concerning federal, state, and local permitting requirements related to hydrology and water quality for the I Street Bridge Replacement Project (proposed project). The proposed project involves construction of a new bridge across the Sacramento River approximately 1,100 feet upstream of the existing I Street Bridge (Figures 1 and 2) and approximately 3,000 feet downstream of the American River. The existing bridge will remain in place, but the associated roadway approaches will be removed. In both Sacramento and West Sacramento, two alternatives for portions of the roadway design are being considered. In the City of Sacramento, two roadway design alternatives address the Railyards Boulevard/Jibboom Street/Bercut Drive intersection. In the City of West Sacramento, two residential access alternatives address properties cut off by the proposed C Street alignment.

The project is located on the Sacramento River within the northern portion of the Sacramento-San Joaquin River Delta in the Lower Sacramento Valley Watershed and the Sacramento Valley Groundwater Basin. The Sacramento River (Knights Landing to the Delta) is impaired for chlordane, DDT (dichlorodiphenyltrichloroethane), dieldrin, mercury, PCBs (polychlorinated biphenyls), and unknown toxicity.

Potential impacts of the proposed project on existing water quality conditions in the Sacramento River include temporary increases in sediments, oil, grease, and chemical pollutants during construction, as well as potential long-term discharges of sediments and other pollutants collected in storm water runoff. Short-term or temporary construction impacts on water quality have the potential to occur during land disturbance activities, material and equipment use and storage at staging areas, and in-water construction activities. Long-term impacts on water quality could occur from increased impervious area, roadway operations, and operation and maintenance activities such as bridge construction maintenance, inspections, and landscaping maintenance.

Impacts from these activities would be avoided or minimized because all construction activities within the Sacramento River would comply with a variety of permits and requirements from agencies, including the Central Valley Regional Water Quality Control Board, U.S. Army Corps of Engineers, California Department of Fish and Wildlife, and the Cities of Sacramento and West Sacramento.

In addition to agency coordination and permit compliance, the proposed project design includes drainage improvements, such as rock slope protection and improved storm drainage facilities. These measures will maintain pre-project drainage patterns (i.e., flows and rates) and minimize the potential for discharges of pollutants to the Sacramento River.

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LIST OF ABBREVIATED TERMS

401 Certification	Section 401 Water Quality Certification
ADA	Americans with Disabilities Act
AEP	Azimuth-over-Elevation Positioning
AGR	Agricultural
Basin Plan	Fourth Edition of the Water Quality Control Plan
BMPs	best management practices
Caltrans	California Department of Transportation
Caltrans MS4 Permit	NPDES Statewide Storm Water Permit Waste Discharge Requirements State of California Department of Transportation
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CGP	Construction General Permit
CIDH	cast-in-drill-hole
Construction General Permit	NPDES Permit for Stormwater Discharges Associated with Construction Activities
CSS	combined sewer system
CVFMP	Central Valley Flood Management Program
CVFPB	Central Valley Flood Protection Board
CVFPP	Central Valley Flood Protection Plan
CWA	federal Clean Water Act
DDT	Dichlorodiphenyltrichloroethane
DFW	California Department of Fish and Wildlife
DSA	Disturbed Soil Area
DWR	California Department of Water Resources
EPA	U.S. Environmental Protection Agency
ER	Environmental Resources
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRMs	Flood Insurance Rate Maps
HBP	Highway Bridge Program
HUC	Hydrologic Unit Code
I-5	Interstate 5
I-80	Interstate 80
IND	Industrial Service Supply
IRR	Irrigation
Ksat	saturated hydraulic conductivity

LID	Low Impact Development
Low Threat Dewatering Permit	General Waste Discharge Requirements for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters in Sacramento County
MS4	Municipal Separate Storm Sewer Systems
MS4 Permit	NPDES General Permit for Municipal Separate Storm Sewer Systems
MTP/SCS	Metropolitan Transportation Plan/Sustainable Communities Strategy
MUN	Municipal and Domestic
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NFIP	National Flood Insurance Program
NGVD	National Geodetic Vertical Datum
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
OHWM	ordinary high water mark
PCBs	polychlorinated biphenyls
Porter-Cologne Act	Porter Cologne Water Quality Control Act
PROC	Industrial Process
proposed project	I Street Bridge Replacement Project
Q100	100-year flood
Q200	200-year flood
Q50	50-year flood
Regional Water Boards	Regional Water Quality Control Boards
RFMP	regional flood management plans
RSP	rock slope protection
RUSLE	Revised Universal Soil Loss Equation
SACOG	Sacramento Area Council of Governments
SAFCA	Sacramento Area Flood Control Agency
Section 404 Permit	Section 404 Clean Water Act authorization for fill of waters of the United States
SFHA	Special Flood Hazard Area
SPCC	Spill Prevention, Control, & Countermeasure
SPFC	State Plan of Flood Control
SRBPP	Sacramento River Bank Protection Project
State Water Board	State Water Resources Control Board
Streambed Alteration Agreement	Section 1602 Department of Fish and Game Code Streambed Alteration Agreement
Statewide SWMP	Statewide Storm Water Management Plan
SWMP	Stormwater Management Program
SWPPP	Storm Water Pollution Prevention Plan
the Delta	Sacramento-San Joaquin River Delta
TMDL	total maximum daily load

U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCG	U.S. Coast Guard
USLE	Universal Soil Loss Equation
WDRs	Waste Discharge Requirements
WPCP	Water Pollution Control Plan
WQAR	Water Quality Assessment Report
WSE	water surface elevation
WSE50	50-year floodwater surface elevation

Chapter 1 Introduction

1.1 Project Description

The City of Sacramento, in cooperation with the City of West Sacramento and the California Department of Transportation (Caltrans), proposes to construct a new bridge over the Sacramento River to replace the vehicle crossing that is currently accommodated by the existing I Street Bridge in order to remove a series of functionally obsolete or structurally deficient bridges (i.e., approach structures). The new connection also would reduce future traffic congestion, improve operations and safety, serve multiple modes of transportation, and comply with current American Association of State Highway and Transportation Officials, Caltrans, and local agency design standards.

The project is subject to state and federal environmental review requirements because of use of federal Highway Bridge Program (HBP) funds from the Federal Highway Administration (FHWA). Accordingly, project documentation is being prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The City of Sacramento is the lead agency under CEQA, with the City of West Sacramento as a responsible agency, and Caltrans is the lead agency under NEPA. The FHWA's other responsibilities for environmental review, consultation, and any other action required in accordance with applicable federal laws for this project will be carried out by Caltrans under its assumption of responsibility pursuant to 23 United States Code (USC) 327.

This project is included in the Sacramento Area Council of Governments (SACOG) *Metropolitan Transportation Plan/Sustainable Communities Strategy 2035* (MTP/SCS).

1.1.1 Project Location

The proposed project is located over the Sacramento River between the Cities of Sacramento and West Sacramento, approximately 1,000 feet north of the existing I Street Bridge (Figure 1). The project limits starting within the City of Sacramento consist of Railyards Boulevard from 200 feet east of Bercut Drive on the east, continuing west over the Sacramento River into the City of West Sacramento along C Street, and terminating approximately 100 feet west of the 5th Street intersection. The project limits also extend along Bercut Drive approximately 500 feet north of Railyards Boulevard, along Jibboom Street 550 feet north of Railyards Boulevard and 300 feet south of Railyards Boulevard, along 3rd Street 50 feet north and south of C Street, along 4th Street 50 feet north and south of C Street, and along 5th Street 50 feet north and south of

C Street. The total length of the project is approximately 0.42 mile along C Street and Railyards Boulevard.

1.1.2 Purpose and Need

The proposed project would construct a new bridge over the Sacramento River between the Cities of Sacramento and West Sacramento to replace the vehicle crossing that is currently provided by the existing I Street Bridge. Construction of the proposed project has independent utility; the project is not dependent on other projects or improvements to meet the purpose and need.

Termini for the proposed project were developed through an iterative process involving engineering design and traffic operations analysis. Preliminary design concepts were tested with the traffic operations analysis model to evaluate how lane configurations influenced peak-hour conditions.

1.1.2.1 Purpose

The purpose and objectives of the project are listed below.

- The project should construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge from C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento, consistent with the adopted findings of the Sacramento River Crossings Alternatives Study for Bridge Location 2 in the North Market Area.
- The new bridge should meet the requirements of the Neighborhood Friendly Bridge definition that the City of Sacramento City Council adopted by resolution on October 18, 2011, which is defined by the following elements.
  - A facility whose primary function is local connectivity rather than regional travel and primarily serves short local trips.
  - A bridge which serves all users, including motorists, bicyclists, pedestrians, low-energy vehicles, and public transit riders.
  - A bridge with aesthetics and dimensions which are architecturally pleasing and contextually appropriate for the adjacent neighborhoods.
  - A bridge that does not exceed or expand the already-planned capacity of the approach roadways (i.e., no widening of approaches just to accommodate bridge flows).

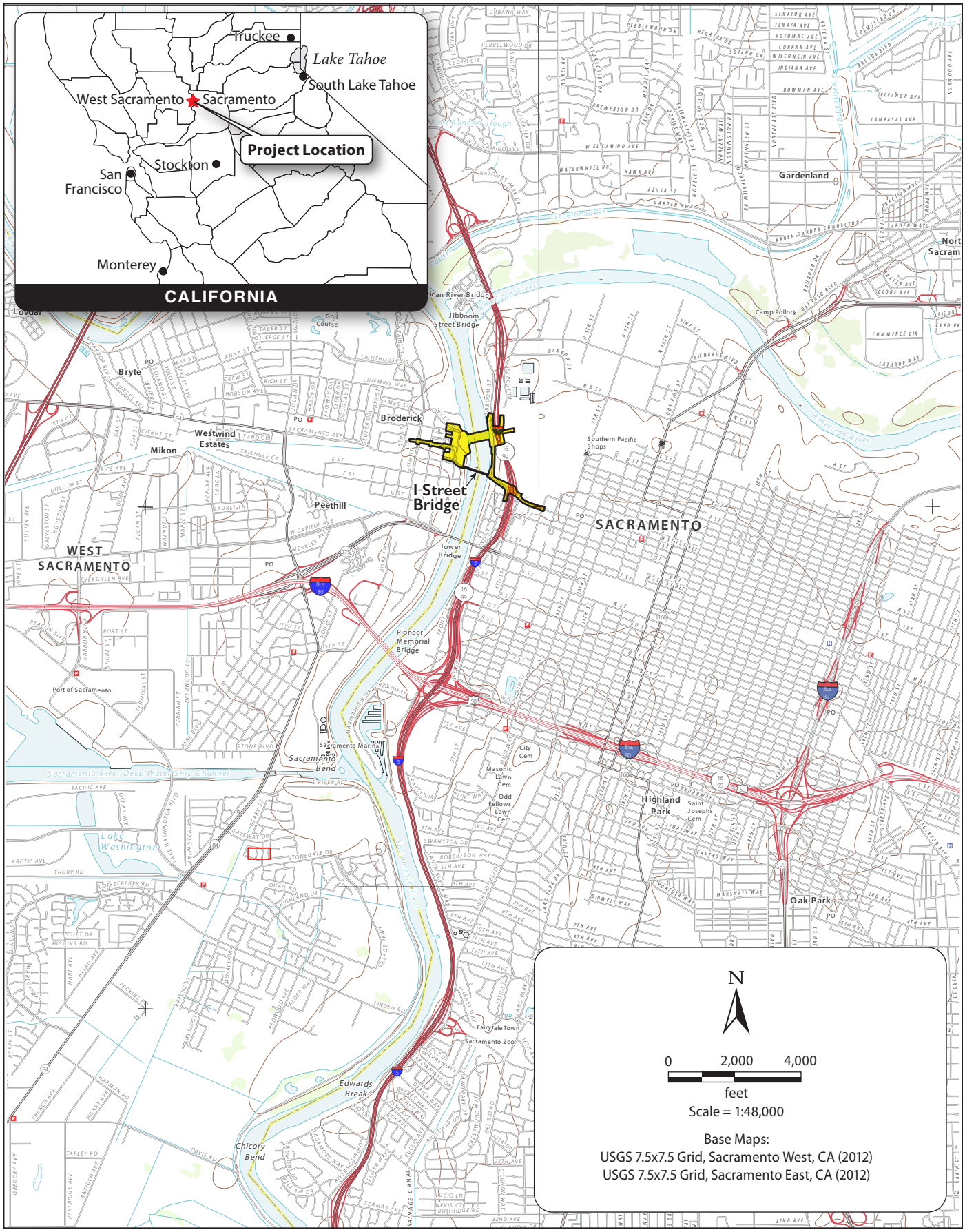

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Figure 1
Vicinity Map

  - A facility which is designed with a target speed equal to or less than the approach roadways.
  - A bridge which reduces the growth in vehicle miles traveled in the adjacent communities.
  - A bridge that does not connect directly to streets which are primarily residential in character.
  - A bridge that is consistent with the Need and Purpose statement [the adopted Sacramento River Crossings Alternatives Study statement] as articulated.

- In addition to the Neighborhood Friendly Bridge definition, the project should include pedestrian and bicycle facilities in the new public crossing that meet Americans with Disabilities Act (ADA) requirements, and facilitate connections to and from the new crossing and the Sacramento River Parkway and Riverfront Park trails.
- The proposed project also would need to construct a movable bridge that satisfies the vertical clearance and river navigation requirements of the U.S. Coast Guard (USCG).
- The project design should not preclude future addition of a streetcar, a separate, stand-alone project being developed by the Cities of West Sacramento and Sacramento.
- The new bridge also is intended to improve the connectivity to, and accessibility of, businesses, recreational areas, and new or redevelopment opportunity sites located in the urban core of Sacramento and West Sacramento.

1.1.2.2 Need

The project is needed for the following reasons.

- The existing I Street Bridge does not fully comply with current design and traffic operation standards due to the following conditions.
  - I Street Bridge limits or restricts traffic capacity and multimodal use. The current bridge width is not sufficient to provide adequate traffic operations, bicycle lanes, or the ability for transit service across the bridge.
  - The I Street Bridge and the four associated approach structures are on the federal eligible bridge list for federal funds for replacement and/or rehabilitation through the HBP. The I Street Bridge has been classified as functionally obsolete, and the existing approach structures have been classified as structurally deficient. The Cities of Sacramento and West Sacramento have decided to pursue replacement through the HBP.

- As adopted by the Sacramento City Council, new crossings of the Sacramento River between the City of Sacramento and City of West Sacramento shall be Neighborhood Friendly. In coordination with staff from the City of West Sacramento and SACOG, the definition for a Neighborhood Friendly Bridge was developed by the City of Sacramento, and the Sacramento City Council adopted the definition by resolution in October 2011. The replacement bridge structure is required to be consistent with the Neighborhood Friendly Bridge definition.
- In addition to the Neighborhood Friendly Bridge requirements, lack of ADA compliance, non-standard and non-continuous sidewalks, and lack of bicycle facilities discourage walking and bicycling on the existing I Street Bridge.
- Section 9 of the Rivers and Harbors Act requires any local, state, or federal agency planning to construct a bridge over a navigable waterway to apply for a bridge permit through the USCG. The USCG requires the new bridge to meet or exceed the existing vertical clearance along the river, which is currently set by the U.S. 50 Pioneer Bridge. In order to comply with the Neighborhood Friendly Bridge definition and meet the USCG requirements for navigation clearance, the new bridge will need to be movable.
- The MTP/SCS identifies that a proposed streetcar will cross over the new bridge from Sacramento to West Sacramento. While the streetcar will be a separate, stand-alone project, the bridge design must not preclude the future addition of a streetcar.
- Limited connectivity to the riverfront reduces the potential to achieve planned urban development and redevelopment of opportunity sites identified in the adopted plans of Sacramento and West Sacramento.

1.1.3 Project Alternatives

This section describes the proposed action and the design alternatives that were developed to meet the identified need through accomplishing the defined purpose(s), while avoiding or minimizing environmental impacts. The alternatives under consideration are one bridge alignment for the new bridge over the Sacramento River and two alternatives for portions of the roadway design in Sacramento and in West Sacramento.

- City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection
  - Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive
  - Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive

- City of West Sacramento Residential Access
  - Alternative 1—C Street Connection to B Street
  - Alternative 2—C Street Connection to 3rd Street
- No-Build (No-Project) Alternative

The proposed project is located in Sacramento and Yolo Counties, over the Sacramento River and between the Cities of Sacramento and West Sacramento, and approximately 1,000 feet north of the existing I Street Bridge (Figure 1). The total length of the project is approximately 0.42 mile along C Street and Railyards Boulevard. The purpose of the project is to construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge from C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento in order to remove a series of functionally obsolete or structurally deficient bridges, consistent with the adopted findings of the Sacramento River Crossings Alternatives Study for Bridge Location 2 in the North Market Area.

1.1.3.1 Build Alternatives

One alignment is proposed for the new bridge over the Sacramento River. A new approximately 860-foot bridge, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides, is proposed. The bridge would include two fixed-span approach structures, approximately 200 feet and 270 feet in length, that tie into the Sacramento and West Sacramento banks of the river, respectively. The center span of the bridge would be an approximately 330-foot movable span that meets the USCG requirements. Roadway improvements on Railyards Boulevard in Sacramento and C Street in West Sacramento also are proposed. In both Sacramento and West Sacramento, two alternatives for portions of the roadway design are being considered. Figure 2 depicts the proposed project and the roadway design alternatives, described below.

- City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection
  - Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive
  - Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive

In the City of Sacramento, Alternative 1 consists of a signalized intersection at Jibboom Street and Bercut Drive, while Alternative 2 consists of a roundabout between these two intersections. Beyond the Jibboom Street and Bercut Drive intersections, the remaining project elements and limits in the City of Sacramento are similar under both alternatives.

- City of West Sacramento Residential Access
  - Alternative 1—C Street Connection to B Street
  - Alternative 2—C Street Connection to 3rd Street

In the City of West Sacramento, the proposed C Street alignment would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. Two alternatives are proposed for maintaining access to these parcels. Alternative 1 would construct a new connection to C Street, approximately 150 feet east of the C Street/3rd Street intersection, that would extend north to B Street and then ultimately connect to the 3rd Street/B Street intersection. Alternative 2 would connect to the same location at C Street as Alternative 1, approximately 150 feet east of the C Street/3rd Street intersection, but would continue north approximately 300 feet, then make a 90-degree left turn, and connect to 3rd Street approximately 300 feet north of C Street.

Common Design Features of the Build Alternatives

The proposed project would construct a new bridge over the Sacramento River between Sacramento and West Sacramento to replace the vehicular crossing that is provided by the existing I Street Bridge. The project would facilitate vehicular and multimodal traffic over the river in order to reduce traffic congestion, improve safety, and remove a number of structurally deficient or functionally obsolete bridges that have reached the limit of their design life. While the existing I Street Bridge over the Sacramento River would remain in-place, the approach structures leading up to the bridge from both directions would be demolished. See Figure 2 for a depiction of the project limits and the approach structures that would be removed.

The Sacramento River is considered to be a navigable waterway of the United States. Under the provisions of the General Bridge Act of 1946, as amended, the USCG must approve proposed location and plans for bridges over navigable waters of the United States prior to commencing construction. In order to comply with the adopted Neighborhood Friendly Bridge definition and the USCG requirement to maintain navigation along the river, the new bridge is proposed to be a movable bridge.

Common design features of the build alternatives are listed below.

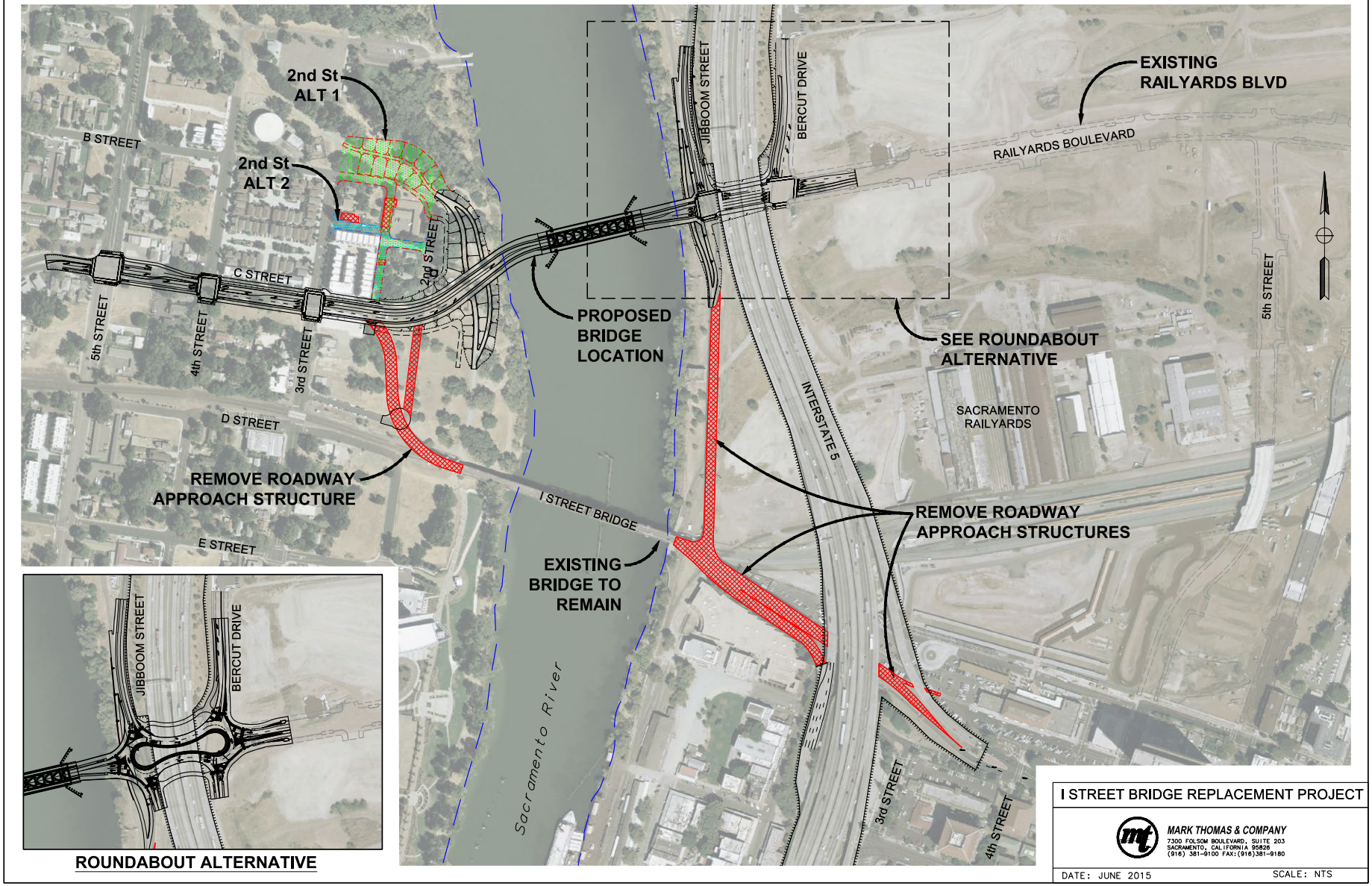

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Figure 2
Proposed Project

New Bridge Construction and Roadway Modifications

Bridge Construction

The proposed project would construct a new bridge over the Sacramento River. The total bridge length would be approximately 860 feet long, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides of the bridge. The bridge would include two fixed-span approach structures that tie into the Sacramento and West Sacramento banks of the river and are approximately 200 feet and 270 feet in length, respectively. The center span of the bridge would be a movable span that meets the USCG requirements. The movable span is anticipated to be approximately 330 feet in length. The bridge soffit elevation would be set 3 feet above the 200-year water surface elevation to comply with the Central Valley Flood Protection Board (CVFPB) freeboard requirements.

The two fixed-span approach structures would be 72 feet wide, with a superstructure depth (or total bridge thickness) of approximately 6 feet. Each approach structure would be a two-span bridge. The abutment at one end of the structure would be constructed on the banks of the river, a center pier would be placed within the river approximately around the existing bank toe of slope, and the other end of the approach structure would be constructed on the piers for the movable span.

Based on coordination with the USCG, the movable span would provide a 278-foot clear channel opening approximately centered at the middle of the river. As such, the movable span has been identified as a vertical lift bridge, which would raise the bridge to a minimum vertical clearance of 59 feet over the maximum river elevation of 31 feet (measured to the NGVD 29 vertical datum). The truss depth of the movable span would be approximately 40 feet, with 6 feet of the structure being below the bridge deck and 34 feet above the bridge deck. The vertical towers would be approximately 130 feet tall, measured from the bridge soffit elevation. The vertical towers would be approximately 33 feet in thickness and the same width as the bridge deck. The total bridge width on the movable span would be 81 feet.

Due to the existing soil conditions, the bridge would be constructed on deep pile foundations. The abutments for the fixed-span approach structures at the river bank would consist of approximately 50 piles per abutment that are driven or cast-in-drill-hole (CIDH), to a depth of approximately 70 feet below the original ground elevation. The center piers for the two fixed-span approach structures (located approximately at the bank toe of slope in the river, below the ordinary high water mark) would consist of 50 driven or CIDH piles per pier that are approximately 70 feet below the original ground elevation. If driven piles are selected for either the abutments or piers, the piles would be precast concrete or steel. The foundations for the

movable span would consist of four large-diameter cast-in-steel-shell piles per pier. Each pile would be 9 feet in diameter, extending approximately 140 feet below the original ground elevation.

Erosion control measures would be installed around the proposed bridge foundations to prevent future scour at the bridge supports. It is anticipated that rock slope protection (RSP) would be installed around the bridge abutments and piers within the water to control erosion.

A bridge fender system also is planned around the movable span piers to protect the piers from errant watercrafts that are navigating along the river. The fender system would include approximately 30 driven concrete or wooden piles around each of the movable span piers. The piles would be driven to a depth of approximately 30 feet below the original ground elevation.

Temporary Falsework

Temporary falsework platforms (trestles) would be required to construct the proposed bridge foundations and approach structures. The platforms would be constructed during the first construction season using temporary piles within the river. Each temporary platform would include approximately 80 driven steel piles; the piles would be either 16-inch diameter or 16-inch H piles. Once installed, the temporary trestle piles would remain in the river throughout the duration of construction and would be removed in the second construction season following completion of construction. In addition, temporary cofferdams would be required to construct the bridge piers within the water. The cofferdams would consist of temporary sheet piles installed around the individual piers. The sheet piles would be installed and removed with a vibratory hammer. Dewatering inside the cofferdams would be required.

Roadway Modifications

City of Sacramento

In Sacramento, Bercut Drive would be modified from Railyards Boulevard north approximately 500 feet. Bercut Drive would be designed to have two northbound lanes at the Railyards Boulevard intersection, tapering down to one northbound lane at the northern project limits, and one southbound lane. Improvements to Bercut Drive south of Railyards Boulevard are not part of, nor needed for, the proposed project and would be constructed if needed as part of a separate future project.

Proposed improvements on Jibboom Street would extend 550 feet north of Railyards Boulevard. The roadway would consist of one travel lane in each direction, on-street Class II bike lanes, sidewalk along the west side of the roadway, and retaining walls of various heights along both

sides of the road. Extension of Jibboom Street south of Railyards Boulevard is not included with, nor needed for, the proposed project and would be constructed if needed as part of a separate future project.

The proposed roadway profile for Railyards Boulevard would be approximately 6 feet higher than the original ground elevation at the Jibboom Street intersection. The profile adjustment is needed in order to satisfy the CVFPB requirements to provide 3 feet of clearance between the 200-year-flood water surface elevation and the bridge soffit (or low chord of the bridge).

City of West Sacramento

Between the bridge touchdown location along C Street in West Sacramento and the 4th Street/ C Street intersection, the roadway would consist of one westbound travel lane, two eastbound travel lanes (the two eastbound travel lanes would taper down to one eastbound lane east of the 3rd Street intersection), a center left-turn lane, on-street Class II bike lanes, on-street parking along the north side of the roadway, and sidewalks along both sides of the roadway. As the roadway through this section currently consists of the proposed number of travel lanes, the widening through this area is primarily needed to support the Class II bike lanes and wider sidewalks.

Along C Street between 4th Street and 5th Street, the roadway would consist of one travel lane in each direction, left-turn lanes, on-street Class II bike lanes, and sidewalks along both sides of the road. All of the improvements through this section would be accommodated within the existing roadway limits.

Class I Bikeway and Levee Modifications and Improvements

City of Sacramento

The existing Class I Sacramento River Parkway along Jibboom Street would be reconstructed approximately 500 feet north and 300 feet south of Railyards Boulevard as part of the proposed project. In order to maintain a continuous off-street Class I path along this section, the path would be grade-separated under the proposed bridge structure. Cyclists and pedestrians approaching Railyards Boulevard in either direction would have the option to continue along the path under the new structure, avoiding the need to cross the roadway. Cyclists and pedestrians who are traveling along the path also would have the option to connect to Railyards Boulevard and cross over the proposed bridge into West Sacramento or turn east into Sacramento. Due to the limited horizontal clearance between the river and the Interstate 5 (I-5) viaduct structure, retaining walls would be needed along the path to account for the vertical elevation difference

between Jibboom Street and the path that continues under the proposed bridge structure. The maximum retaining wall height along the bike path would be 16 feet.

City of West Sacramento

The proposed project would require improvements to the existing levee along the West Sacramento side of the river, where the proposed bridge alignment would connect to C Street. The existing levee does not meet current standards required by Title 23 of the California Code of Regulations (CCRs). Extending approximately 300 feet north and south of the proposed C Street alignment, the levee cross-section would be reconstructed to meet current design standards, which would require 3:1 side slopes on the landside and waterside of the levee, and a 20-foot-wide crown at the top of the levee. The levee improvements also would include a slurry cutoff wall extending to a depth of 110 feet below the original ground elevation. In addition, the proposed roadway profile would be approximately 6 feet higher than the original ground elevation as it crosses over the levee. In order to maintain access to the levee for inspection and maintenance services, access roads would be constructed from the new roadway to the top of the improved levee section. The proposed grading for the levee would require relocation of the existing water tower that is located along 2nd Street, just north of the proposed C Street alignment. The tower would be relocated to the northwest, approximately 43 feet from its existing location.

The new levee maintenance road also would serve as the future Class I River Walk Park trail extension in West Sacramento. Similar to the trail improvements proposed as part of the project in Sacramento, the trail would be grade-separated under the proposed bridge structure. Cyclists and pedestrians approaching C Street in either direction would have the option to continue along the trail under the new structure, avoiding the need to cross the roadway. Cyclists and pedestrians who are traveling along the trail also would have the option to connect to C Street to cross over the proposed bridge into Sacramento or head west on C Street.

Storm Water Drainage Management

Drainage for the proposed roadway would be conveyed to the existing storm drain system installed within Railyards Boulevard and C Street. Railyards Boulevard currently drains storm water to the east along the roadway and then into a retention basin south of Railyards Boulevard. C Street drains storm water west along the roadway and then ultimately south beyond the project limits.

As is standard with all construction projects, the contractor would be required to install temporary best management practices (BMPs) to control any runoff or erosion from the project

site into the surrounding waterways. These temporary BMPs would be installed prior to any construction operations and would be in place for the duration of the contract. The removal of these BMPs would be the final operation, along with project site cleanup.

Structure Demolition and Roadway Modifications

Following completion of the new bridge connections at Railyards Boulevard and C Street, traffic would be diverted to the new bridge, and the four existing approach structures to the I Street Bridge would be removed. Bridge numbers 24C0364L, 24C0364R, 22-0033, and 22C0154 would be demolished and the foundations would be removed to a depth of 3 feet below the original ground elevation. Encroachment permits from Caltrans and Union Pacific Railroad would be needed to complete the bridge removal. The existing I Street Bridge is owned and operated by Union Pacific Railroad and would continue to remain in-place and used by trains following construction of the new bridge.

As part of the removal of the existing approach structures, the project would include modifications to I Street within the City of Sacramento from the southbound I-5 on-ramp east to the 5th Street intersection. The modification would include signing and striping revisions, demolition of existing roadway sections that are no longer required, and removal of bridge abutments and foundations.

Staging, Storage, and Proposed Access during Construction

Two staging areas would be used to store materials and equipment during construction, such as pipe materials, precast manholes and drop inlets, steel girders, piles, and rebar, along with the construction equipment when not in use. One area would be located south of Railyards Boulevard under I-5 in Sacramento; the other area would be located west of the landward side of the levee, south of the new bridge location in West Sacramento. The staging area located along Railyards Boulevard would be accessed via the existing intersection at Jibboom Street. The staging area in West Sacramento would be accessed via the existing 2nd Street connection at 3rd Street, south of C Street. The staging areas would be in use throughout the construction duration; the areas would be returned to their pre-project conditions at the completion of the project.

Utility Relocations

A number of public and private utilities would need to be relocated or adjusted to grade as part of the project, including existing water, sewer, gas, electric, and communication facilities within Jibboom Street, Bercut Drive, C Street, and 2nd Street.

Traffic Management and Detours during Construction

While most of the project would be constructed outside of existing roadways, some areas would require temporary detours or staged construction.

Along Jibboom Street at the proposed Railyards Boulevard intersection, the new roadway profile would be raised approximately 6 feet above the original ground elevation. To maintain access to the existing Jibboom Street viaduct south of Railyards Boulevard during the roadway construction, a temporary access road would be needed. The proposed temporary access road would connect to the existing Jibboom Street viaduct abutment approximately 350 feet south of Railyards Boulevard. The temporary road would then continue under I-5 and connect to the Railyards Boulevard/Bercut Drive intersection. The temporary road would require placement of temporary fill material and a roadway structural section that would be removed after construction of the new bridge. Traffic traveling north along Jibboom Street would continue north along Bercut Drive to access the Richards Boulevard/I-5 interchange.

In order to complete the improvements at Jibboom Street and Railyards Boulevard, Jibboom Street would be closed to traffic approximately 600 feet north of Railyards Boulevard. Traffic traveling south along Jibboom Street to continue over the existing I Street Bridge into West Sacramento would be detoured over to Bercut Drive at Richards Boulevard. Traffic would then use the temporary access road to connect to the Jibboom Street viaduct structure. The temporary access road would be in place for approximately 2 years, after which traffic would use the new roadways and new bridge.

The Sacramento River Parkway trail along Jibboom Street also would require temporary re-routing during construction. The temporary alignment for the trail would follow the temporary Jibboom Street alignment south of Railyards Boulevard. Cyclists and pedestrians would then continue following a detour north along Bercut Drive to Richards Boulevard, where they could then connect back to the Parkway on the west side of I-5. The detour would be in place for approximately 2 years.

During construction, traffic along C Street would be maintained along the existing approach structure until the new bridge is constructed.

Project Construction Sequence

New bridge and roadway construction would occur first, followed by demolition of the four approach structures that connect to the existing I Street Bridge. Once the new bridge and roadways are constructed, traffic would be diverted to the new bridge in order to allow

demolition adjacent to the existing bridge. Construction of the project is expected to take approximately 30 months.

Property Acquisition

The project would require temporary and permanent property acquisitions along C Street, 3rd Street, and 2nd Street within the City of West Sacramento and along Railyards Boulevard, Jibboom Street, Bercut Drive, and I Street within the City of Sacramento.

Along C Street, temporary and permanent acquisitions would be required along the south side of the roadway to accommodate the construction of standard shoulders, bike lanes, and sidewalks—from the intersection of 4th Street to the Sacramento River.

Along 3rd Street and 2nd Street, temporary and permanent acquisitions would be needed from the Union Pacific Railroad on the south, to just north of the B Street intersections, for construction of the proposed roadway and levee improvements.

Along Railyards Boulevard, Jibboom Street, and Bercut Drive, temporary and permanent acquisition would be needed from the current state-owned right-of-way for I-5, for construction of the roadway. In addition, temporary and permanent acquisitions would be needed along Jibboom Street for the proposed temporary detour road and Class I bikeway improvements.

Temporary acquisition would be required along the existing I Street connection to facilitate removal of the existing viaduct structures. Due to the limited space available in Old Sacramento, it is anticipated that construction activities would occur from the parking lot at the intermodal station.

Unique Features of Build Alternatives

In both the City of Sacramento and the City of West Sacramento, two alternatives for portions of the roadway design are being considered.

City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection

Alternative 1 consists of a signalized intersection at Jibboom Street and Bercut Drive, while Alternative 2 consists of a roundabout between these two intersections. Beyond the Jibboom Street and Bercut Drive intersections, the remaining project elements and limits are similar under both alternatives.

Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive

Under Alternative 1, Railyards Boulevard would be extended west over the Sacramento River; east of Bercut Drive. Railyards Boulevard would consist of two westbound lanes and one eastbound lane. Between Jibboom Street and Bercut Drive, Railyards Boulevard would consist of two westbound lanes and three eastbound lanes; two eastbound lanes would be trapped into left-turn lanes onto Bercut Drive, and one eastbound lane would continue along Railyards Boulevard. West of the Jibboom Street intersection, Railyards Boulevard would consist of one lane in each direction.

Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive

Under Alternative 2, Railyards Boulevard would be extended west over the Sacramento River. East of Bercut Drive, Railyards Boulevard would consist of two westbound lanes and one eastbound lane. Between Jibboom Street and Bercut Drive, Railyards Boulevard would consist of a roundabout with two lanes in each direction. One westbound lane would be a trap onto northbound Jibboom Street, and one westbound lane would continue onto the new bridge. One eastbound lane would be trapped into left-turn lanes onto Bercut Drive, and one eastbound lane would continue along Railyards Boulevard. West of Jibboom Street, Railyards Boulevard would consist of one lane in each direction.

City of West Sacramento Residential Access

The new C Street alignment would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. Two alternatives are proposed for maintaining access to these parcels.

Alternative 1—C Street Connection to B Street

Alternative 1 would construct a new connection to C Street approximately 150 feet east of the 3rd Street intersection. The new access road would be 30 feet wide, extend north to B Street, and then ultimately connect to the 3rd Street/B Street intersection. This alternative would require right-of-way acquisitions from six individual parcels and removal of two structures. One structure is located on APN 010-101-010 and appears to be an individual residence. Another structure is located on APN 010-101-013 and appears to be an apartment building that supports up to four individual apartments. As B Street currently is constructed along the existing levee, the roadway improvements also would require an additional 500 feet of improvements to the levee. Similar to the improvements identified along C Street, the levee cross-section would be reconstructed to meet current design standards, which require 3:1 side slopes on the landside and waterside of the levee, with a 20-foot-wide crown at the top of the levee. The levee

improvements also would include a slurry cutoff wall that extends to a depth of 110 feet below the original ground elevation.

Alternative 2—C Street Connection to 3rd Street

Alternative 2 would connect to the same location at C Street, approximately 150 feet east of the 3rd Street intersection and continue north approximately 300 feet. This alternative would then make a 90-degree left turn and connect to 3rd Street approximately 300 feet north of C Street. This alternative would require right-of-way acquisition from seven individual parcels and removal of three structures. One structure is located on APN 010-101-010 and appears to be an individual residence. Another structure is located on APN 010-101-013 and appears to be an apartment building that supports up to one individual apartment. The last structure is located on APN 010-101-004 and appears to be an individual residence.

1.1.3.2 No Build (No-Project) Alternative

Under the No Build Alternative, the existing I Street Bridge would remain in use for vehicle, bicycle, and pedestrian access between the Cities of Sacramento and West Sacramento. No changes to traffic patterns on I Street or C Street would occur. The four approach structures would remain in place and in use; and there would be no changes to existing roadways, levees or Class I bikeways.

Improvements and development of transportation infrastructure would continue following the General Plans of both cities, the Sacramento Railyards Specific Plan (approved December 2007), and the Washington Specific Plan (adopted May 1996). The Sacramento Railyards Specific Plan identifies the extension of Railyards Boulevard west to a Tee intersection at Jibboom Street. Railyards Boulevard at Bercut Drive would consist of two westbound lanes and one eastbound lane. The same number of lanes on Railyards Boulevard would extend west to the intersection with Jibboom Street; at this point, the left westbound lane on Railyards Boulevard would become a dedicated left-turn onto southbound Jibboom Street, and the right westbound lane would be a dedicated right-turn onto northbound Jibboom Street.

In West Sacramento, future changes to C Street would be based on the Washington Specific Plan, which identifies 12-foot-wide sidewalks and 7-foot-wide Class II bike lanes along the roadway. The connection to the I Street Bridge would not change.

1.1.3.3 Permits and Approvals Needed

The following permits and coordination likely will be required for the project (Table 3).

Table 1. Permits and Approvals Needed

Agency	Permit/Approval	Status
U.S. Coast Guard	Authorization under General Bridge Act of 1946, as amended, for new bridge over navigable waters of the United States	Initiated
U.S. Army Corps of Engineers	Section 404 Clean Water Act authorization for fill of waters of the United States	Not yet initiated
National Marine Fisheries Service	Coordination regarding threatened and endangered species	Not yet initiated
U.S. Fish and Wildlife Service	Coordination regarding threatened and endangered species	Not yet initiated
California Department of Fish and Wildlife	Section 1602 Department of Fish and Game Code Streambed Alteration Agreement	Not yet initiated
Central Valley Regional Water Quality Control Board	Section 401 Water Quality Certification and coverage under the existing Caltrans National Pollutant Discharge Elimination System (NPDES) Permit (Order No. 00-06-DWQ)	Not yet initiated
State Water Resources Control Board	NPDES Permit for Stormwater Discharges Associated with Construction Activities	Not yet initiated
Central Valley Flood Protection Board	Encroachment Permit	Not yet initiated
State Lands Commission	Lease of State Lands	Not yet initiated
Sacramento Area Flood Control Agency	Approval of changes to levee	Not yet initiated
West Sacramento Area Flood Control Agency	Approval of changes to levee	Not yet initiated
Sacramento Metropolitan Air Quality Management District	Formal notification prior to construction	Not yet initiated
Yolo-Solano Air Quality Management District	Formal notification prior to construction	Not yet initiated

1.2 Approach to Water Quality Assessment

This WQAR is intended to fulfill the requirements of NEPA and CEQA, and to provide information, to the extent possible, for National Pollution Discharge Elimination System (NPDES) permitting. The document includes a discussion of the proposed project, the physical setting of the project area, and the regulatory framework with respect to water quality. It also provides data on surface water and groundwater resources within the project area and the water quality of these waters, describes water quality impairments and beneficial uses, identifies potential water quality impacts/benefits associated with the proposed project, and recommends avoidance and/or minimization measures for potentially adverse impacts.

The WQAR is organized as follows.

- Chapter 1: Introduction
- Chapter 2: Regulatory Setting

- Chapter 3: Affected Environment
- Chapter 4: Environmental Consequences
- Chapter 5: Avoidance and Minimization Measures
- Chapter 6: References
- Chapter 7: Preparers Qualifications

Chapter 2 Regulatory Setting

This chapter defines the regulatory environment associated with water quality at the federal, state, and local levels. In particular, the chapter defines Caltrans' regulatory environment related to water quality.

Several permits must be approved prior to the project construction phase. Of the permits and approvals for the project shown in Table 1, the primary water quality permits that likely will be required for project construction include the Section 404 Clean Water Act (CWA) authorization for fill of waters of the United States (Section 404 Permit), Section 1602 Department of Fish and Game Code Streambed Alteration Agreement (Streambed Alteration Agreement), Section 401 Water Quality Certification (401 Certification), the NPDES Permit for Stormwater Discharges Associated with Construction Activities (Construction General Permit [CGP]), Low-Threat Dewatering Permit and General Dewatering Permit for Land Discharges.

2.1 Federal Laws and Requirements

2.1.1 Clean Water Act

The primary federal law regulating water quality is the CWA. In 1972 Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to waters of the United States from any point source unlawful unless the discharge is in compliance with an NPDES permit. The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." EPA has delegated enforcement of the CWA in California to the State Water Resources Control Board (State Water Board) and its nine Regional Water Quality Control Boards (Regional Water Boards). The following CWA sections pertain to the project.

2.1.1.1 Sections 303, 304, and 305 – Impaired Waters, TMDLs, and Water Quality Criteria

The State of California adopts water quality standards to protect beneficial uses of state waters as required by Section 303(d) of the CWA and the Porter Cologne Water Quality Control Act (Porter-Cologne Act). Section 303(d) of the CWA established the total maximum daily load (TMDL) process to guide the application of state water quality standards (see the discussion of state water quality standards below). To identify candidate water bodies for TMDL analysis, the State Water Board generated a list of water quality–limited segments. These stream or river

segments are impaired by the presence of pollutants such as sediment and are more sensitive to disturbance because of this impairment.

Section 304(a)(1) of the CWA requires development of criteria for water quality that accurately reflect the latest scientific knowledge. These criteria are based solely on data and scientific judgments on pollutant concentrations and environmental or human health effects. Section 304(a) also provides guidance to states and tribes in adopting water quality standards. Criteria are developed for the protection of aquatic life as well as for human health.

In addition to the impaired water body list required by Section 303(d), Section 305(b) requires states to develop a report assessing statewide surface water quality. Both CWA requirements are addressed through development of a 303(d)/305(b) Integrated Report, which addresses both an update to the 303(d) list and a 305(b) assessment of statewide water quality. The State Water Board developed a statewide 2010 California Integrated Report (State Water Resources Control Board 2011) based on the Integrated Reports from each of the nine geographically separated Regional Water Boards. The 2010 California Integrated Report was approved by the State Water Board at a public hearing on August 4, 2010; and EPA issued its final decision and approval of the report on October 11, 2011.

All of the 303(d)-listed impaired waters with potential to be affected by the project are shown in Table 5 (see Section 3.3.4, List of Impaired Waters). These waters will be evaluated as part of the project, and minimization measures will be implemented to protect waters from further impairment.

2.1.1.2 Section 401 – Water Quality Certification

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the United States must obtain a 401 Certification, which certifies that the project will be in compliance with state water quality standards. The most common federal permit triggering 401 Certification is a CWA Section 404 permit, issued by the U.S. Army Corps of Engineers (USACE). The 401 Certifications are obtained from the appropriate Regional Water Board, dependent on the project location, and are required before USACE issues a Section 404 Permit.

In some cases, the Regional Water Board may have specific concerns with discharges associated with a project. As a result, the Regional Water Board may issue a set of requirements known as Waste Discharge Requirements (WDRs) under the State Water Code (Porter-Cologne Act). WDRs define activities, such as inclusion of specific features, effluent limitations, monitoring,

and plan submittals, that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

The proposed project involves placement of fill materials in waters of the United States; therefore, a 401 Certification must be obtained from the Central Valley Regional Water Board.

2.1.1.3 Section 402—National Pollutant Discharge Elimination System

The 1972 amendments to the federal Water Pollution Control Act established the NPDES program to control discharges of pollutants from point-source discharges (discharges from a known source of pollutants). The NPDES program is the primary federal program that regulates point-source and non-point-source discharges (discharges from diffuse sources of pollutants) to waters of the United States.

The 1987 amendments to the CWA created a new section of the CWA devoted to storm water permitting (Section 402). EPA has granted the State of California primacy in administering and enforcing provisions of the CWA and NPDES within state boundaries. NPDES permits are issued by the State Water Board and the nine Regional Water Boards in California. General NPDES Permits cover industrial, construction, and municipal storm water discharges, and some point-source discharges for specific activities Individual NPDES Permits cover point-source discharges from wastewater facilities.

CWA Section 402 General NPDES Permits that apply to the project are the Construction General Permit and Municipal Separate Storm Sewer System (MS4) Permit requirements. Because the project involves disturbance of more than 1 acre of land, a General Construction Permit will be required. As discussed under the state requirements for the NPDES program (see Section 2.2.13), the project would comply with applicable MS4 requirements.

2.1.1.4 Section 404—Dredge/Fill Permitting

The discharge of dredged or fill material into waters of the United States is subject to permitting specified under Title IV (Permits and Licenses) of the CWA and specifically under Section 404 (Discharges of Dredge or Fill Material). Section 404 permits are administered by the USACE.

The Sacramento River is a navigable water under jurisdiction of the USACE, and the proposed project involves in-water activities. Therefore, a Section 404 Permit will be required for the project.

2.1.1.5 National Flood Insurance Program

In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer-funded disaster relief for flood victims and the increasing amount of damage caused by floods. The NFIP makes federally backed flood insurance available for communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage. The Federal Emergency Management Agency (FEMA) manages the NFIP. FEMA creates Flood Insurance Rate Maps (FIRMs) that designate 100-year floodplain zones and delineate flood hazard areas. A *100-year floodplain zone* is an area with a one in one hundred (1%) chance of being flooded in any one year based on historical data.

The project is located within a FEMA-designated floodway and 100-year floodplain (Federal Emergency Management Agency 2012).

2.2 State Laws and Requirements

2.2.1 Porter-Cologne Water Quality Control Act

The Porter-Cologne Act, established in 1969 under Division 7 (Water Quality) of the California Water Code, complements the CWA. The Act established the State Water Board and divided the state into nine regions, each overseen by a Regional Water Board. The State Water Board is the primary state agency responsible for protecting the quality of the State's surface water and groundwater supplies—although much of its daily implementation authority is delegated to the Regional Water Boards, which are responsible for implementing CWA Sections 401, 402, and 303(d). In general, the State Water Board manages water rights and statewide regulation of water quality, while the Regional Water Boards focus exclusively on water quality within their regions.

The Porter-Cologne Act provides for development and periodic review of Water Quality Control Plans (basin plans) for each region. Basin plans identify beneficial uses of water bodies and their tributaries, and water quality objectives to protect those uses. Basin plans are implemented primarily by using the NPDES permitting system to regulate waste discharges so that water quality objectives are met. Basin plans are updated every 3 years and provide the technical basis for determining WDRs and taking enforcement actions.

Beneficial uses represent the services and qualities of a water body (i.e., the reasons the water body is considered valuable). Water quality objectives represent the standards necessary to protect and support designated beneficial uses.

The project lies within the jurisdiction of the Central Valley Water Board. The Central Valley Water Board is responsible for implementing its basin plan. The *Fourth Edition of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins* was updated in 2011 (Central Valley Regional Water Quality Control Board 2011).

2.2.1.1 State Water Resources Control Board and Regional Water Quality Control Boards

The State Water Board adjudicates water rights; sets water pollution control policy; issues Water Board Orders on matters of statewide application; and oversees water quality functions throughout the state by approving basin plans, TMDLs, and NPDES permits. The Regional Water Boards are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

2.2.1.2 National Pollution Discharge Elimination System Program

Municipal Separate Storm Sewer Systems

CWA Section 402 mandates programmatic permits for municipalities to address storm water discharges, which are regulated under the NPDES General Permit for Municipal Separate Storm Sewer Systems (MS4) (MS4 Permit). Phase I MS4 regulations cover municipalities with populations greater than 100,000, certain industrial processes, or construction activities disturbing an area of 5 acres or more. Phase II (Small MS4) regulations require that storm water management plans be developed by municipalities with populations smaller than 100,000 and construction activities disturbing 1 or more acres of land area. The project would disturb more than 1 acre of land.

MS4 permits require that cities and counties develop and implement programs and measures to reduce the discharge of pollutants in storm water discharges to the maximum extent possible, including management practices, control techniques, system design and engineering methods, and other measures as appropriate. As part of permit compliance, these municipalities have created storm water management plans for their respective locations. The plans outline requirements for municipal operations, industrial and commercial businesses, construction sites, and planning and land development. These requirements may include multiple measures to control pollutants in storm water discharge. During implementation of specific projects under the program, project applicants are required to follow the guidance contained in the storm water management plans as defined by the permit holder in that location.

Because the project area is located within Caltrans, City of Sacramento, and City of West Sacramento rights-of-way (ROW), three different MS4 permits apply to the project: (1) Caltrans General NPDES MS4 Permit that covers statewide Caltrans municipal storm water discharges, (2) Sacramento County MS4 Permit for the City of Sacramento, and (3) State Water Board's Small MS4 Permit for the City of West Sacramento. These permits are discussed in more detail below.

Caltrans MS4 Permit

The State Water Board has identified Caltrans as an owner/operator of an MS4 pursuant to federal regulations. Caltrans holds a CWA Section 402 General NPDES MS4 Permit that covers primarily municipal storm water discharges within Caltrans ROW (Order No. 2012-0011-DWQ [NPDES No. CAS000003] NPDES Statewide Storm Water Permit WDRs for State of California Department of Transportation [Caltrans MS4 Permit] – effective July 1, 2013). The Caltrans MS4 Permit only covers Caltrans rights-of-way, properties, facilities, and activities in the state.

The Caltrans MS4 Permit, currently under revision, contains three basic requirements.

a. The Department must comply with the requirements of the Construction General Permit (CGP) (see below);

b. The Department must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and

c. The Department storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (BMPs) to the Maximum Extent Practicable, and other measures as the State Water Board determines to be necessary to meet the water quality standards.

To comply with the permit, Caltrans developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The Statewide SWMP assigns responsibilities within Caltrans for implementing storm water management procedures and practices, in addition to training, public education and participation, monitoring and research, program evaluation, and reporting activities. The Statewide SWMP describes the minimum procedures and practices Caltrans uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest Statewide SWMP in order to address storm water runoff.

Sacramento County MS4 Permit

The City of Sacramento is currently covered under Waste Discharge Requirements for the Cities of Citrus Heights, Elk Grove, Folsom, Galt, Sacramento, and County of Sacramento Stormwater Discharges from Municipal Separate Storm Sewer Systems in Sacramento County (Sacramento County MS4 Permit) (NPDES No. CAS082597; Order No. R5-2015-0023). As part of permit compliance, the Sacramento County MS4 Permitees developed a Sacramento Stormwater Quality Partnership and a Sacramento Stormwater Quality Improvement Program, which is a comprehensive program comprised of various program elements and activities designed to reduce stormwater pollution to Maximum Extent Practicable (MEP) and eliminate prohibited non-stormwater discharges through a NPDES municipal stormwater discharge permit.

The City of Sacramento's Stormwater Quality Improvement Program was established in 1990. The Program includes pollution reduction activities for construction sites, industrial sites, illegal discharges and illicit connections, new development, and municipal operations. The Program also includes an extensive public education effort, target pollutant reduction strategy and monitoring program. The Stormwater Quality Improvement Plan (SQIP) (July 2007) outlines the priorities, key elements, strategies, and evaluation methods of the City's Stormwater Management program for 2007-2011 (Sacramento Stormwater Quality Partnership 2009).

Under the Sacramento County MS4 Permit, storm water mitigation measures are required to be incorporated into project design plans for Planning Priority Projects. These include development projects (residential, industrial and commercial), parking lots, redevelopment project (or land-disturbing activity) that results in the creation, addition, or replacement of 5,000 square feet or more of impervious surface area on an already developed site, or projects located in or directly adjacent to or discharging directly to an Environmentally Sensitive Area (ESA)[1], which meet thresholds. In addition, the Sacramento Stormwater Quality Partnership developed a Hydromodification Management Plan that provides technical guidance on LID measures[2]/ hydromodification[3] strategies for the development community in the Sacramento urbanized area.

[1] A project is within a ESA if it meets one or more of the following criteria: The project is located near receiving waters designated as (1) Tributary to a Clean Water Act 303(d) Water Body, (2) RARE beneficial use, (3) Areas of Special Biological Significance (ASBS), Multiple Species Conservation Program (MSCP), any other ESA which have been identified by a County.

[2] LID are implemented to mimic a site's predevelopment hydrology by using de-centralized design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall. Examples include bioretention facilities (rain gardens), cisterns and rain barrels, permeable pavement, bioswales, and biostrips.

[3] Hydromodification means the change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, installation of dams and water impoundments, and excessive stream bank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

The I Street Bridge is located adjacent to an ESA because the Sacramento River has 303(d)-listed impairments, and therefore implementation of storm water mitigation measures into the project design plan are required (Sacramento Stormwater Quality Partnership 2009). The project is not subject to hydromodification requirements, however, because projects discharging directly, through drainage channels, or through pump stations, to the Lower American River or Sacramento River will be exempt from the regulations of the HMP (Sacramento Stormwater Quality Partnership 2013).

State Water Board's Small MS4 Permit

The City of West Sacramento is designated as a Traditional Small MS4 Permittee currently covered under the State Water Resources Control Board's Phase II MS4 (Statewide Phase II MS4 Permit) (NPDES Order No. 2013-001-DWQ; General Permit No. CAS000004). This permit requires controls be implemented to reduce the discharge of pollutants in stormwater discharges to the maximum extent possible, including management practices, control techniques, system design and engineering methods, and other measures as appropriate. As part of permit compliance, the City of West Sacramento developed a Stormwater Management Program (SWMP) Planning Document in 2003. This plan outlines stormwater requirements for municipal operations, industrial and commercial businesses, construction sites, and planning and land development. These requirements may include multiple measures to control pollutants in stormwater discharge. During implementation of specific projects, project applicants will be required to follow the guidance contained in the SWMP.

Traditional permittees are required to comply with Section E of the Statewide Phase II MS4 Permit, which specifies requirements for site design measures[4], LID design standards, alternative post-construction stormwater management program, and operations and management requirements for post construction stormwater management. Under the Statewide Phase II MS4 permit, site design measures are required for all projects that create and/or replace between 2,500 square feet and 5,000 square feet of impervious surface. LID design standards are required to be implemented for all development projects that create and/or replace 5,000 square feet or more of impervious surface. If and where MS4 requirements are triggered for this project, the project will comply with all applicable permit requirements. Permittees also have to develop and implement a program to assess operation and maintenance activities and develop applicable BMPs, such as for bridge maintenance, including re-chipping, grinding, saw cutting, and painting.

[4] Site design measures are implemented to reduce site runoff. Examples of these measures include stream setbacks and buffers, soil quality improvement and maintenance, tree planting and preservation, rooftop and impervious area disconnection, porous pavement, green roofs, vegetated swales, and rain barrels and cisterns.

Construction General Permit

Construction General Permit (Order 2009-0009-DWQ as amended by Order No.2010-0014-DWQ and 2012-0006-DWQ) is a CWA Section 402 General NPDES Permit. It was adopted on November 16, 2010, became effective on February 14, 2011. The permit regulates storm water discharges from land disturbance activities of 1 acre or greater, or smaller sites that are part of a larger common plan of development. For all projects subject to the CGP, applicants are required to develop and implement an effective SWPPP.

By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least 1 acre must comply with the provisions of the CGP. Construction activity that results in soil disturbances of less than 1 acre is subject to the CGP if there is potential for significant water quality impairment resulting from the activity as determined by the Regional Water Board. Operators of regulated construction sites are required to develop SWPPPs; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the CGP.

The CGP separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the risk level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and pre- and post-construction aquatic biological assessments during specified seasonal windows. A risk level assessment was done for the project and provided in Section 3.3.5.

General Waste Discharge Requirements for Low-Threat Discharges to Surface Waters

Low-threat discharges to surface waters are currently regulated by the Central Valley Regional Water Board under a regional general permit, General Waste Discharge Requirements for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters in Sacramento County (Low-Threat Dewatering Permit) (Order R5-2014-0030). This permit is required if discharges occur continuously over a period of time. Otherwise, one-time surface water discharges for surface in-water work or groundwater excavation are typically covered under a 401 Certification, if one is obtained. A Notice of Intent (NOI) and Report of Waste Discharge must be submitted to the Central Valley Regional Water Board to comply with this dewatering permit. For all discharges, the permit specifies effluent limitations for total suspended solids, turbidity, biological oxygen demand, oil and grease, settleable solids, sulfides, phenols, residual chlorine, and methylene blue active substances—in addition to several other effluent limitations for specific compounds.

General Waste Discharge Requirements for Low-Threat Discharges to Land

Low-threat discharges to land are currently regulated by the State Water Board under a regional general permit, Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality (General Dewatering Permit for Land Discharges) (Order No. 2003–0003-DWQ). Similar to the Low-Threat Dewatering Permit, a NOI and a Report of Waste Discharge must be submitted to the Central Valley Regional Water Board to comply with this dewatering permit. Among other activities, this permit covers small temporary dewatering projects that discharge groundwater to land from small construction projects, excavation projects, or dewatering of underground utility vaults.

California Department of Fish and Wildlife Streambed Alteration Agreement

Under Chapter 6 of the California Fish and Game Code, the California Department of Fish and Wildlife (CDFW) is responsible for the protection and conservation of the State's fish and wildlife resources. Section 1602 et seq. of the code defines the responsibilities of CDFW and requires that public and private applicants obtain an agreement to "divert, obstruct, or change the natural flow or bed, channel, or bank of any river, stream, or lake designated by the department (CDFW) in which there is at any time an existing fish or wildlife resource or from which those resources derive benefit, or will use material from the streambeds designated by the department." A Streambed Alteration Agreement is required under Section 1602 of the California Fish and Game Code for all activities that involve temporary or permanent activities within State jurisdictional waters.

A Section 1602 Streambed Alteration Agreement will be required for the proposed project due to potential effects on the Sacramento River.

2.2.2 Central Valley Flood Protection Board Encroachment Permit

An encroachment permit must be obtained from the CVFPB for all proposed activities related to placement of encroachments within, under, or over the State highway rights-of-way. An *encroachment* is defined in Section 660 of the California Streets and Highways Code as "any tower, pole, pole line, pipe, pipeline, fence, billboard, stand or building, or any structure, object of any kind or character not particularly mentioned in the section, or special event, which is in, under, or over any portion of the State highway rights of way. 'Special event' means any street festival, sidewalk sale, community-sponsored activity, or community-approved activity."

Central Valley Flood Protection Act of 2008

The Central Valley Flood Protection Act of 2008 (California Water Code Section 9600) establishes the 200-year flood event as the minimum level of flood protection for urban and urbanizing areas. As part of the state's FloodSafe Program, those urban and urbanizing areas protected by flood control project levees must receive protection from the 200-year flood event level by 2025. The California Department of Water Resources (DWR) and the CVFPB collaborated with local governments and planning agencies to prepare the Central Valley Flood Protection Plan (CVFPP). The CVFPP was developed under a process implemented by the Central Valley Flood Management Program (CVFMP), which was established in 2008 to guide, manage, and implement integrated flood management actions in the Central Valley. The CVFPP, as set forth in California Water Code Section 9614, was adopted on June 29, 2012. The CVFPP proposes a "systemwide investment approach" for integrated, sustainable flood management in areas currently protected by facilities of the State Plan of Flood Control. The Public Draft 2012 CVFPP fulfills the intent and requirements of the Central Valley Flood Protection Act of 2008. The CVFPP is required to be updated every 5 years beginning in 2017.

The proposed project is located within the Lower Sacramento Regional Work Group of the CVFMP Lower Sacramento and Delta North Regional Flood Management planning area. This planning area includes the cities of Sacramento, Woodland, Davis, and Rio Vista; adjoining unincorporated areas of Yolo, Solano, Sacramento and Sutter Counties; and reclamation districts on both sides of the Sacramento River and Yolo Bypass, from the Fremont Weir to Rio Vista. Following adoption of the 2012 CVFPP, DWR launched a regional effort to help local agencies develop comprehensive regional flood management plans (RFMPs) that describe local flood management priorities, challenges, and potential funding mechanisms, as well as define site-specific improvement needs. The RFMPs present local agencies' perspectives of flood management with a prioritized list of projects that need to be implemented to reduce flood risks in each region. Each plan presents an assessment of the costs and benefits for proposed projects while considering their potential contribution to an integrated multibenefit and basin-wide solution.

Central Valley Flood Protection Board Regulations

The CVFPB exercises regulatory authority within its jurisdiction to maintain the integrity of the existing flood control system and designated floodways by issuing permits for encroachments (CCRs, Title 23, Division 1, Tier 1b Updates, and Division 1.5 – California Water Code Section 8710 et seq.). The CVFPB has mapped designated floodways along more than 60 streams and rivers in the Central Valley. In addition, Table 8.1 of the CCRs, Title 23 contains several hundred stream reaches and waterways that are regulated streams. Projects that encroach

on a designated floodway or regulated stream, or that are within 10 feet of the toe of a state-federal flood control structure (levee), require an encroachment permit and submission of an associated application, including an environmental assessment questionnaire. A project must demonstrate that it will not reduce the channel flow capacity and that it will comply with channel and levee safety requirements.

In cooperation with USACE, the CVFPB enforces standards for construction, maintenance, and protection of adopted flood control plans that will protect public lands from floods. The jurisdiction of the CVFPB encompasses the Central Valley, including all tributaries and distributaries of the Sacramento River, the San Joaquin River, and designated floodways (CCRs, Title 23, Section 2). The CVFPB has all the responsibilities and authorities necessary to oversee future modifications as approved by USACE, pursuant to assurance agreements with USACE and the USACE Operation and Maintenance Manuals (33 Code of Federal Regulations, Section 208.10; 33 U.S. Code, Section 408).

The Sacramento River (Keswick Dam to the west end of Sherman Island) is a CVFPB-designated floodway.

2.3 Regional and Local Requirements

2.3.1 City of Sacramento

2.3.1.1 Sacramento Area Flood Control Agency

The Sacramento Area Flood Control Agency (SAFCA) was formed in 1989 to address the Sacramento area's vulnerability to catastrophic flooding. This vulnerability was exposed during the record flood of 1986, when Folsom Dam exceeded its normal flood control storage capacity and several area levees nearly collapsed under the strain of the storm. In response, the City of Sacramento, the County of Sacramento, the County of Sutter, the American River Flood Control District, and Reclamation District No. 1000 created SAFCA through a Joint Exercise of Powers Agreement to provide the Sacramento region with increased flood protection along the American and Sacramento Rivers.

2.3.1.2 City of Sacramento 2035 General Plan

The following policies from the City of Sacramento 2035 General Plan (City of Sacramento 2015a) are applicable to this project with respect to hydrology and water quality.

Goal Environmental Resources (ER) 1.1. Water Quality Protection. Protect local watersheds, water bodies and groundwater resources, including creeks, reservoirs, the Sacramento and American rivers, and their shorelines.

- **ER 1.1.3 Stormwater Quality.** The City shall control sources of pollutants and improve and maintain urban runoff water quality through storm water protection measures consistent with the City's National Pollution Discharge Elimination System (NPDES) Permit.
- **ER 1.1.4 New Development.** The City shall require new development to protect the quality of water bodies and natural drainage systems through site design, (e.g., cluster development), source controls, storm water treatment, runoff reduction measures, best management practices (BMPs) and Low Impact Development (LID), and hydromodification strategies consistent with the city's NPDES Permit.
- **ER 1.1.5 Limit Stormwater Peak Flows**. The City shall require all new development to contribute no net increase in stormwater runoff peak flows over existing conditions associated with a 100-year storm event.
- **ER 1.1.6 Post-Development Runoff.** The City shall impose requirements to control the volume, frequency, duration, and peak flow rates and velocities of runoff from development projects to prevent or reduce downstream erosion and protect stream habitat.
- **ER 1.1.7 Construction Site Impacts.** The City shall minimize disturbances of natural water bodies and natural drainage systems caused by development, implement measures to protect areas from erosion and sediment loss, and continue to require construction contractors to comply with the City's erosion and sediment control ordinance and stormwater management and discharge control ordinance.

Goal Utilities 4.1 Adequate Stormwater Drainage. Provide adequate stormwater drainage facilities and services that are environmentally-sensitive, accommodate growth, and protect residents and property.

- **U4.1.1 Adequate Drainage Facilities.** The City shall ensure that all new drainage facilities are adequately sized and constructed to accommodate stormwater runoff in urbanized areas.
- **U4.1.2 Master Planning.** The City shall implement master planning programs to: Identify facilities needed to prevent 10-year event street flooding and 100-year event structure flooding; Ensure that public facilities and infrastructure are designed pursuant to approved basin master plans; Ensure that adequate land area and any other elements are provided for facilities subject to incremental sizing (e.g., detention basins and pump stations); Consider the use of "green infrastructure" and Low Impact Development.
- **U4.1.3 Regional Stormwater Facilities.** The City shall coordinate efforts with Sacramento County and other agencies in the development of regional stormwater facilities.

- **U4.1.4 Watershed Drainage Plans.** The City shall require developers to prepare watershed drainage plans for proposed developments that define needed drainage improvements per City standards, estimate construction costs for these improvements and comply with the City's National Pollutant Discharge Elimination System (NPDES) permit.
- **U4.1.6 New Development.** The City shall require proponents of new development to submit drainage studies that adhere to City stormwater design requirements and incorporate measures, including "green infrastructure" and Low Impact Development (LID) techniques, to prevent on- or off-site flooding.

Goal Environmental Constraints 2.1 Flood Protection. Protect life and property from flooding.

- **EC 2.1.11 New Development.** The City shall require evaluation of potential flood hazards prior to approval of development projects and shall regulate development in urban and urbanizing areas per state law addressing 200-year level of flood protection.
- **EC 2.1.12 New Development Design.** The City shall require new development located within a special (100-year) flood hazard area to be designed to minimize the risk of damage in the event of a flood.

2.3.1.3 River District Specific Plan

The River District Specific Plan (City of Sacramento 2011) establishes planning and design standards for redevelopment of approximately 773 acres of land located at the confluence of the American and Sacramento Rivers, north of the downtown core of the City of Sacramento. The following goal and policy related to storm water are applicable to the project.

Utility Infrastructure

Goal I1: Reduce water consumption and wastewater flows by implementing conservation techniques.

Policy I1a: Encourage the installation of techniques such as bioswales, permeable pavement, and greywater systems to reduce stormwater runoff.

2.3.1.4 Sacramento Railyards Specific Plan

The Sacramento Railyards Specific Plan (City of Sacramento 2007) addresses a 244-acre area in downtown Sacramento located immediately north of the Central Business District, east of the Sacramento River, south of North B Street, and west of the federal courthouse and the Alkali Flat neighborhood. Goals and polices from that plan that relate to hydrology and water quality are listed below.

Sustainability

Goal S-1: Maximize the use of sustainable development practices in the Plan Area.

Policy S-1.14: Encourage the installation of bio-swales to prevent stormwater runoff and further pollution of Sacramento's natural resources.

Policy S-1.15: Provide permeable surfaces wherever possible to prevent stormwater runoff.

Policy S-1.17: Reduce stormwater runoff through the capture and re-use of rainwater.

Utilities and Community Services

Goal CS-2: Provide for the sanitary sewage needs of the project while facilitating the City in complying with standards established by the City's NPDES permit with the Regional Water Quality Control Board.

Policy CS-2.2: Offset the increased sanitary sewer flows into the combined sewer system through on-site detention of storm water flows, and discharge of retained storm water to the Sacramento River.

Goal CS-3: Provide a storm drainage system to serve the Plan Area that achieves the water quality provisions of the City's municipal NPDES Stormwater Permit.

Policy CS-3.1: Provide for the separation of combined storm and sanitary sewer flows in the Plan Area.

Policy CS-3.2: Design the storm drainage system to meet the design criteria of the City's Department of Utilities, Sacramento City design standards and the terms of the City's NPDES permit.

2.3.1.5 City of Sacramento Stormwater Management and Control Code

The City Stormwater Management and Control Code (Chapter 13.16 of the City Code) is intended to control non-storm water discharges to the storm water conveyance system; eliminate discharges to the storm water conveyance system from spills, dumping, or disposal of materials other than storm water; and reduce pollutants in urban storm water discharges to the maximum extent practicable. Non-storm water discharges are prohibited except where the discharge is regulated under an NPDES permit. Discharges from specified activities that do not cause or contribute to the violation of any plan standard, such as landscape irrigation and lawn watering and flows from fire suppression activities, also are exempt from this prohibition. Discharges of pumped groundwater not subject to an NPDES permit may be permitted to discharge to the

storm water conveyance system upon written approval from the City and in compliance with the City's conditions of approval.

2.3.1.6 City of Sacramento Grading, Erosion, and Sediment Control Ordinance

The City of Sacramento Grading, Erosion, and Sediment Control Ordinance (Title 15, Chapter 15.88 of the City Code) sets forth rules and regulations to control land disturbances, landfill, soil storage, pollution, and erosion and sedimentation resulting from construction activities. With limited exceptions, grading approval must be received from the City Department of Utilities before construction. All project applicants, regardless of project location, are required to prepare and submit separate erosion and sediment control plans applicable to the construction and post-construction periods. The ordinance also specifies other requirements, such as written approval from the City for grading work within the right-of-way of a public road or street, or within a public easement.

2.3.1.7 Sacramento Stormwater Quality Improvement Plan

The Sacramento Stormwater Management Program is a comprehensive program comprised of various program elements and activities designed to reduce storm water pollution to the maximum extent practicable and eliminate prohibited non-storm water discharges in accordance with federal and state laws and regulations. These laws and regulations are implemented through NPDES municipal storm water discharge permits. In 1990, the County of Sacramento and the Cities of Sacramento, Citrus Heights, Elk Grove, Folsom, Galt, and Rancho Cordova, collectively known as the Sacramento Stormwater Quality Partnership (Partnership), applied for and received one of the first areawide NPDES MS4 storm water permits in the country and began development of core storm water management program elements and activities to address local urban runoff water quality problems. As part of the program, a SQIP (City of Sacramento 2009) was prepared in compliance with the MS4 Permit as a comprehensive plan that describes the Partnership's Stormwater Management Program.

2.3.2 City of West Sacramento

2.3.2.1 West Sacramento Area Flood Control Agency

The City of West Sacramento and Reclamation Districts 900 and 537 make up the joint powers authority that forms the West Sacramento Area Flood Control Agency (WSAFCA). WSAFCA's mission is to plan and build flood risk reduction facilities that protect the City of West Sacramento's residents and property. WSAFCA is also the regional floodplain administrator carrying out duties associated with floodplain management and flood preparedness activities.

2.3.2.2 City of West Sacramento General Plan

The City of West Sacramento General Plan (City of West Sacramento 2008) was adopted in 1990 and is currently undergoing an update. The plan has been amended several times since 1990, and the current 2008 version outlines the following key goals and policies that relate to hydrology and water quality.

Public Facilities and Services Element

Goal C: To maintain an adequate level of service in the City's storm drainage system to accommodate runoff from existing and future development and to prevent property damage due to flooding.

Policy 1. Where practical and economical, the City shall upgrade existing drainage facilities as necessary to correct localized flooding problems.

Policy 2. The City shall continue to expand and develop storm drainage facilities to accommodate the needs of existing and planned development.

Policy 4. The City shall, through a combination of drainage improvement fees and other funding mechanisms, ensure that new development pays its fair share of the costs of drainage system improvements

Policy 5. The City shall cooperate with other responsible agencies in ensuring that levees surrounding the city are maintained and improved to provide a minimum 200-year flood protection.

Natural Resources Element

Goal A: To protect water quality in the Sacramento River, Sacramento Deep Water Ship Channel, Lake Washington, and the area's groundwater basin.

3. The City shall not approve new development that has a significant potential for adversely affecting water quality in the Sacramento River, the Deep Water Ship Channel, Lake Washington, or the area's groundwater basin.

5. The City shall utilize the CEQA process to identify and avoid or mitigate potential groundwater pollution problems resulting from new commercial and industrial development.

7. The City shall implement measures to minimize the discharge of sediment into its watercourses.

Health and Safety

Goal B: To prevent loss of life, injury, and property damage due to flooding.

Policy 1. The City shall continue to participate in the National Flood Insurance Program. To this end, the City shall ensure that local regulations are in full compliance with standards adopted by the Federal Emergency Management Agency.

Policy 5. New development shall be designed to prevent the diversion of floodwaters onto neighboring parcels.

2.3.2.3 Washington Specific Plan

The Washington Specific Plan (City of West Sacramento 1996) defines a vision for redeveloping the 194-acre urban area of West Sacramento bounded by Tower Bridge Gateway, the Sacramento River, A Street, and portions of 6th and 8th Street. Key goals and policies that relate to hydrology and water quality are found in the Public Facilities and Services section and are the same as those in the City of West Sacramento General Plan (see above).

2.3.2.4 City of West Sacramento Municipal Code

The following regulations of the City's Municipal Code regarding hydrology and water quality are applicable to the project.

Title 13, Public Services, Chapter 13.10—Urban Stormwater Quality Management and Discharge Control

This chapter contains the following regulations and requirements to prevent, control, and reduce stormwater pollutants:

13.10.130—requirement to prevent, control, and reduce stormwater pollutants;

13.10.140—compliance with BMPs;

13.10.150—requirement to eliminate illegal discharges;

13.10.170—watercourse protection;

13.10.180—damage to the storm drain system;

13.10.190—requirement to remediate;

13.10.200—requirement to monitor and analyze;

13.10.210—containment and notification of spills;

13.10.220—authority to inspect;

13.10.230—authority to sample, establish sampling devices, and test; and

13.10.240—City inspection of stormwater conveyance system.

Title 15—Buildings and Construction

Chapter 15.08, Grading, establishes standards for the preparation of sites and construction activities to protect the health, safety and general welfare of the public by protecting against unwarranted or unsafe grading, drainage works or other aspects of site development. The following provisions in Chapter 15.08 are applicable:

15.08.180 Erosion control: Contains basic design principles and standards that shall be incorporated in grading operations to control erosion and reduce sedimentation.

15.08.280 Runoff control: Contains performance standards for a surface runoff control plan if required by the City manager or designee.

15.08.300 Environmental standards: Contains compliance requirements for CEQA and other environmental laws.

Chapter 15.50, 200 Year Flood Protection, includes the following requirements for 200-year flood protection:

15.50.060 No building permit until compliance demonstrated:

> No building permit shall be issued in connection with the construction of any new structure until the applicant for the building permit demonstrates to the satisfaction of the floodplain administrator that: (1) prior to occupancy, the structure will have 200 year flood protection; and (2) any improvements constructed or measures implemented by the applicant to ensure 200-year flood protection will not significantly increase the risk of flooding or the effect of flooding on any adjacent or nearby properties. An applicant shall demonstrate compliance either by the construction of flood management improvements or other mitigation measures beyond those set forth in Title 18, or the payment to the City of an in-lieu flood management fee established by resolution of the City Council. The fees shall be paid at the time of issuance of building permits.

15.50.080 Integration with Title 18: Contains requirements for coordination with Title 18 below. In the event of any conflict, the more stringent requirements will apply.

2.3.2.5 City of West Sacramento Urban Stormwater Quality Management and Discharge Control Ordinance

The City's Grading, Erosion, and Sediment Control Ordinance (Title 13, Chapter 13.10 of the City Code) sets forth rules and regulations to protect and promote the health, safety, and general welfare of the citizens of the city by controlling non-storm water discharges to the storm water conveyance system, by eliminating discharges to the storm water conveyance system from spills, dumping, or disposal of materials other than storm water, and by reducing pollutants in urban storm water discharges to the maximum extent practicable.

2.3.2.6 City of West Sacramento Stormwater Management Program Planning Document

The City of West Sacramento developed the Stormwater Management Program Planning Document (2003) to address storm water quality within the City's jurisdiction. The SWMP addresses a wide variety of activities conducted in urbanized areas of the City that are sources of pollutants in storm water. This planning document was developed to comply with the State Water Board's Small MS4 General Permit.

Chapter 3 Affected Environment

3.1 Introduction

Hydrology and water quality are affected by climatological conditions, topography, and the types and amounts of pollutants discharged. This chapter describes regional existing hydrology and water quality conditions in the project vicinity as well as local existing hydrology and water quality conditions in the immediate project area.

3.2 General Setting

3.2.1 Population and Land Use

The I Street Bridge is a bridge crossing over the Sacramento River between the West Sacramento to the west, and Sacramento to the east. Both the City of Sacramento and City of West Sacramento are located in the northern portion of the Central Valley, at the confluence of the American River and Sacramento River. The City of Sacramento is located in Sacramento County, and the City of West Sacramento is located in Yolo County. As reported by the 2010 Census, the population of the City of Sacramento was 466,488, and that of the City of West Sacramento was 48,744 (U.S. Census 2010).

The immediate project area is characterized by the Sacramento River, vegetated levee banks, and land uses on either side of the river. Primarily industrial and vacant land uses are located east of the river, and suburban residential and commercial land uses are located to the west. The project site is not located near a state scenic highway or other designated scenic corridor (California Department of Transportation 2015).

3.2.2 Topography

The project is located in the northern portion of the Central Valley, called the Sacramento Valley, which drains into the Sacramento-San Joaquin River Delta (the Delta). The valley boundaries are Lake Shasta to the north, the Coast Ranges to the west, the Sierra Nevada to the east, and the Delta to the south. The valley floor itself is relatively flat with exception of the Sutter Buttes. (Ceres 2014).

The project site is relatively flat. Based on the Natural Resources Conservation Service (NRCS) soil unit map, slopes within the project area are 0–2% (Natural Resources Conservation Service 2015). Therefore, a 1% slope was assumed for this WQAR.

3.2.3 Hydrology

Regional Hydrology

The project is located in the Sacramento River Basin, which has a total drainage area of approximately 27,000 square miles. Within the basin, the project site is located within the Lower Sacramento Valley Watershed. The basin drains the eastern slopes of the Coast Ranges, Mount Shasta, the western slopes of the southernmost region of the Cascades, and the northern portion of the Sierra Nevada. The Sacramento Valley Watershed is approximately 5,500 square miles (Sacramento River Watershed Program 2010). Figure 3 shows watersheds and hydrological features within the project vicinity.

According to the U.S. Geological Survey National Watershed Boundary Dataset, the project area lies within three hydrologic units. The eastern bridge landing and Sacramento River are within Lake Greenhaven-Sacramento River [Hydrologic Unit Code (HUC) 180201630701]. On the western landing, the area north of I Street is within Tule Canal-Toe Drain (HUC 180201630302), and the area south of I Street is within Toe Drain-Cache Slough (HUC 180201630606). (U.S. Geological Survey 2015).

Local Hydrology

Precipitation and Climate

The climate of Sacramento is Mediterranean, which is characterized as damp to wet mild winters and hot, dry summers. The rainy season generally occurs between October and April, and the total average annual rainfall is 17.59 inches (Table 4). (Western Regional Climate Center 2015a).

Table 2. Month Average Precipitation at the Sacramento Executive Airport

Monthly Average Total Precipitation (inches)												Total Annual
Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	
3.56	3.03	2.50	1.28	0.54	0.16	0.02	0.05	0.24	0.95	2.10	3.06	17.59

Source: Western Regional Climate Center 2015a

The annual mean temperature is 61.0 °F, with the monthly daily average temperature ranging from 46.4 °F in December to 75.5 °F in July. Summer heat is generally moderated by the “Delta breeze” coming from the Delta and ultimately the San Francisco Bay, and temperatures cool down sharply at night. (Western Regional Climate Center 2015b.)

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Figure 3
Watersheds and Hydrological Features within the Project Vicinity

Surface Streams

Sacramento River

The I Street Bridge crosses the Sacramento River at approximately 0.75 mile downstream of its confluence with the American River. The Sacramento River is the largest river in California. The Sacramento River carries 31% of the State's total surface water runoff. Primary tributaries to the Sacramento River are the Pit, Feather, and American Rivers. The headwaters of the Sacramento River are in the Klamath Mountains in northern California; the river flows 445 miles before joining the San Joaquin River 40 miles south of the City of Sacramento, which ultimately flows to San Francisco Bay.

The Sacramento River, beginning at the I Street Bridge, falls within the legal description of the Delta (California Department of Water Resources 1995). Before development of the Sacramento area, the river had a wide natural floodplain. Today, the river is heavily altered, with hydroelectric and water supply impoundments throughout the course of the river and a network of flood control levees through populated areas. (Sacramento River Watershed Program 2015.)

The preliminary results of the wetland delineation for the project indicate that the location of the ordinary high water mark (OHWM) in the Sacramento River was based on the elevation of 19 feet National Geodetic Vertical Datum (NGVD), or mean sea level, that was previously determined by the USACE at the I Street Bridge. Observations in the field further confirmed this location based on the presence of shelving, silt deposition, and wracking[5]. The average width of the Sacramento River at the OHWM is approximately 672 feet. The channel bottom is a natural substrate, presumably sand and sediment, but water turbidity makes visual confirmation of the composition difficult. The river banks are mostly steeply sloped and support riparian forest vegetation, with rip-rap near the bottom of the slope. (ICF International 2015a).

American River

The headwaters of the American River are the Sierra Nevada; the river flows 119 miles until converging with the Sacramento River. Similar to the Sacramento River, the American River is heavily modified by dams and diversions for hydroelectricity and irrigation demands. (U.S. Geological Survey 2015.)

The Lower American River originates from Folsom Lake, a man-made reservoir created by Folsom Dam 30 miles east of Sacramento. Folsom Lake is a multipurpose reservoir that stores water for irrigation; domestic, municipal, and industrial use; hydropower; recreation; water

[5] Wracking typically refers to lines of debris from past materials piled up on along the channel banks.

quality; and fisheries flows. Nimbus Dam, 7 miles downstream from Folsom Dam, stores water from Folsom Dam hydropower releases and re-regulates them via releases to provide for a steady flow downstream in the American River. This allows the release of water from Folsom Dam for power generation to fluctuate with daily power demands. The Lower American River has levees on its north and south banks for about 13 miles from the Sacramento River to Carmichael on the north end. Portions of the floodplain have been acquired by the City or County of Sacramento and are managed cooperatively as the American River Parkway. (Sacramento River Watershed Program 2015).

Storm Drainage System

The City of Sacramento owns and operates a combined sewer system (CSS) that conveys domestic and commercial wastewater and storm water runoff from downtown Sacramento, East Sacramento, and Land Park areas. The City of Sacramento also owns and operates a separate sanitary sewer system that conveys domestic and commercial wastewater from parts of the city surrounding the CSS to the north, east, and south; the storm water is carried and discharged directly into local waterways within the Lower Sacramento River watershed. In the City of West Sacramento, storm water from north of Interstate 80 (I-80) is carried through a system of both surface ditches (in more residential areas) and pipes (in more commercial areas). Approximately 95% of the water (Harbor, Riske, Washington, and 5th Street pump stations) is then discharged (pumped) into the Yolo Bypass. Approximately 5% of the water (Lighthouse and Raley pump stations) is discharged into the Sacramento River. (City of West Sacramento 2003.)

The project area is served by the City of Sacramento's CSS to the Sacramento River, as well as a separate storm water system on the east side of the bridge and the City of West Sacramento's separate storm water system to the Yolo Bypass.

Floodplains

As shown in Figure 4, the eastern side of the I Street Bridge is located within 100-year Flood Zone AE. This zone is a FEMA-identified Special Flood Hazard Area (SFHA), an area subject to flooding during the 100-year storm event (1% annual chance of flooding) (Federal Emergency Management Agency 2012). The western side of the channel is protected from the 100-year flood by levees. Development in an SFHA is regulated by federal, state, and local agencies. Flood Zone AE applies to the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood elevations. The landings (or approaches) of the I Street Bridge are outside of the 100-year FEMA flood zone. They are within a Zone X (unshaded) or Zone C, which are areas subject to minimal flooding that are outside the 500-year flood zone (Federal Emergency

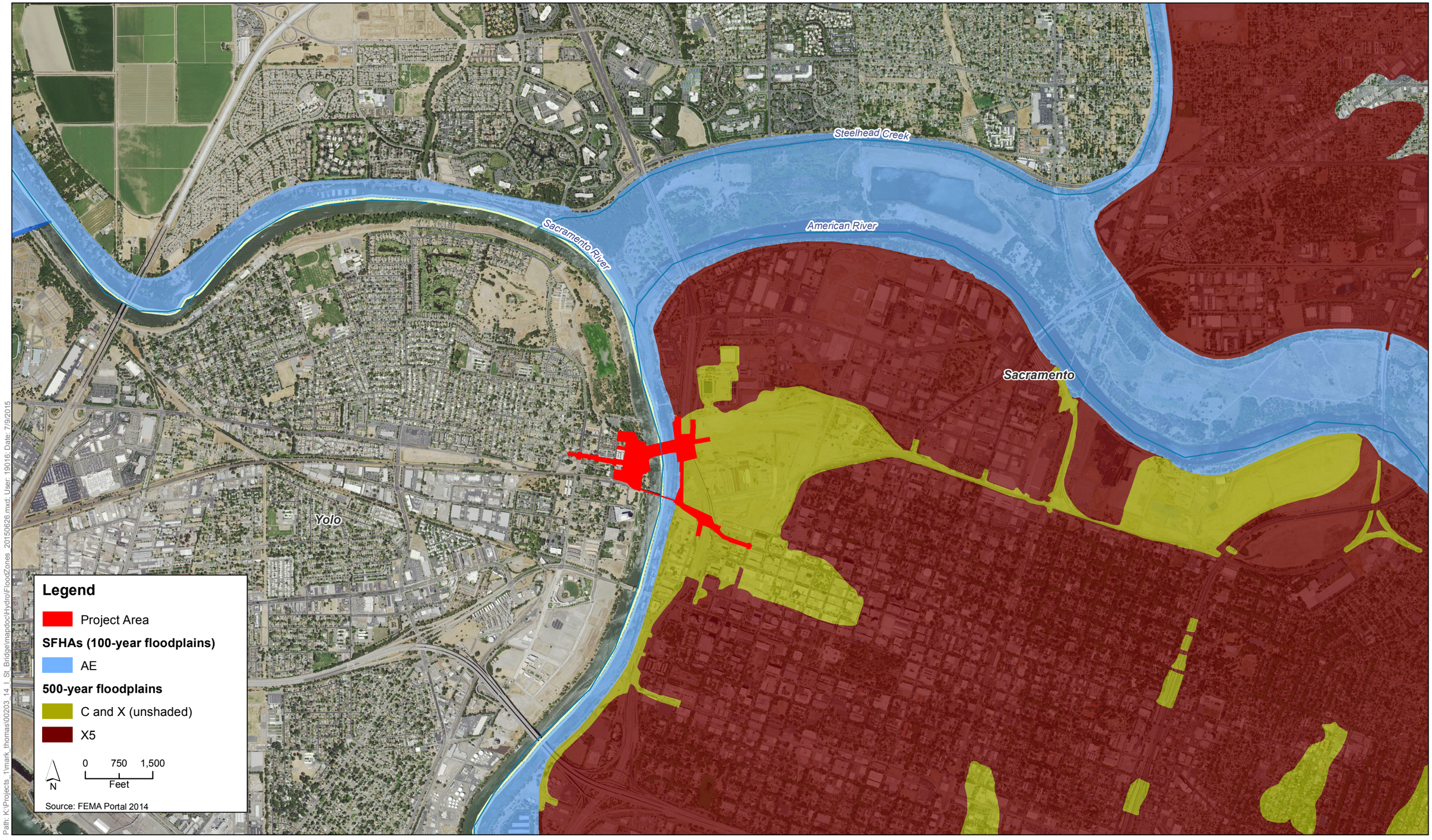


Figure 4
FEMA Flood Zones within the Project Vicinity

Management Agency 2012). The surrounding area on the eastern end is designated as Flood Zone X5, which is a 500-year flood zone. Descriptions of flood zone designations are provided in Table 3.

Table 3. FEMA Flood Zone Designations in the Project Vicinity

Zone	Zone Description
AE	Areas with a 1 percent annual chance of flooding. Base flood elevations are determined and shown on Federal Emergency Management Agency flood maps.
X (unshaded) or C	Area of minimal flood hazard, usually depicted on Flood Insurance Rate Maps as above the 500-year flood level. Zone C may have ponding and local drainage problems that do not warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood and protected by levee from the 100-year flood.
X5	An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; or an area protected by levees from 100-year flooding.

Source: Federal Emergency Management Agency 2012

As required by the CVFPB, levees within urban areas of the Central Valley need to be able to provide for a 200-year flood event level of protection. The proposed project is located within the Lower Sacramento Regional Work Group of the CVFMP Lower Sacramento and Delta North Regional Flood Management planning area. The Lower Sacramento and Delta North Regional Working Group has branded itself as FloodProtect and released their RFMP in July 2014.

Both Sacramento and West Sacramento have a history of serious flooding, beginning in the 1800's when the City of Sacramento was founded and continuing until the 1986 Folsom Dam flood. Prior to development, the area would have been flooded by seasonal runoff every year. Following the population growth in the area, flood control levees, weirs, and dams were constructed to protect the area from flooding. SAFCA is the responsible agency for maintaining flood protection along the American and Sacramento Rivers. (California Department of Water Resources 2010).

The Lower Sacramento River/Delta North Flood Management Planning Region contains a number of flood control facilities—both locally-owned and operated and State-owned and operated through the State Plan of Flood Control (SPFC). The closest SPFC facility to the project site is the Sacramento Weir, located on the Sacramento River just upstream of the confluence of the Sacramento and American Rivers. This structure allows excess water to be discharged into the Yolo Bypass via the Sacramento Bypass and to reduce pressure on downstream levees during high flows. Both the Sacramento and American Rivers are surrounded by SPFC levees. The Sacramento River Bank Protection Project (SRBPP) was initiated to evaluate the levees bordering the river and reduce stream bank erosion along the levees to minimize the threat of a

flood along the Sacramento River. The USACE, Sacramento District is responsible for implementation of the project in conjunction with its non-federal partner, the CVFPB.

Municipal Supply

City of Sacramento drinking water comes from two main sources: surface water from the American and Sacramento Rivers (84% of total supply) and groundwater (16% of total supply). Sacramento has two intake structures, one located on the American River and one located on the Sacramento River. Each feeds water to the E.A. Fairbairn Water Treatment Plant on the American River and the Sacramento River Water Treatment Plant on the Sacramento River. (City of Sacramento 2015.)

Similarly, the main source of drinking water for the City of West Sacramento is the Sacramento River. The surface water intake structure is located at Bryte Bend upstream of the confluence of the Sacramento and American Rivers. In addition to surface water, the City of West Sacramento operates two groundwater wells that primarily provide water during emergencies, such as drought periods. Water is treated to drinking water quality at the George Kristoff Water Treatment Plant (previously known as the Bryte Bend Water Treatment Plant). (City of West Sacramento 2010.)

Many groundwater wells exist within the basin, and most are used to supply individual domestic demands or small agricultural operations. The basin has an extensive system of both shallow and deep aquifers, which the county depends on for domestic and agricultural water supply. Recent droughts indicate that water supplies in the Sacramento Valley are vulnerable to overdraft.

Groundwater Hydrology

Regional Groundwater Hydrology

The project site is within the larger Sacramento Valley Groundwater Basin. Each approach (or landing) of the I Street Bridge is located within a different subbasin. The eastern landing of the I Street Bridge is within the South American Subbasin, whereas the western landing is within the Yolo Subbasin.

The South American Subbasin is bounded on the east by the Sierra Nevada, on the west by the Sacramento River, on the north by the American River, and on the south by the Cosumnes and Mokelumne Rivers. The subbasin is recharged by subsurface inflow from American River percolation and by precipitation on the valley floor. Groundwater levels declined consistently from the 1960’s to 1980’s but have since recovered, except for some wells within the vicinity of the City of Sacramento (California Department of Water Resources 2004).

Several sites of significant groundwater quality impairment are within the South American Subbasin, including three EPA Superfund sites: Aerojet, Mather Field, and the Sacramento Army Depot. Other sites with groundwater quality impairment are the Kiefer Boulevard Landfill, an abandoned Pacific Gas & Electric Company site on Jibboom Street near Old Sacramento, and the Southern Pacific and Union Pacific Rail Yards in downtown Sacramento, which is located adjacent to the project site. (California Department of Water Resources 2004).

The Yolo Subbasin is bounded on the east by the Sacramento River, on the west by the Coast Ranges, on the north by Cache Creek, and on the south by Putah Creek. Similar to the South American Subbasin, the subbasin is recharged by subsurface inflow from American River percolation and by precipitation on the valley floor. During periods of drought, groundwater levels decline, but long-term trends do not indicate any significant decline in water levels—except for localized pumping depressions in the vicinity of the Davis, Woodland, and Dunnigan/Zamora areas (California Department of Water Resources 2004).

Groundwater quality in the Yolo Subbasin is generally considered to be good for both agricultural and municipal uses, even though the water is hard to very hard overall. (California Department of Water Resources 2004).

The primary source of groundwater recharge for both subbasins is applied irrigation water and direct rainfall. Recharge of aquifers typically occurs along the streambeds of creeks and canals. Recharge occurs naturally and also through reservoir releases, which can be used as effective conjunctive water use facilities to minimize groundwater overdraft and land subsidence.

Local Groundwater Hydrology

Groundwater is expected to vary seasonally. Groundwater was encountered during previous drilling explorations at a depth of approximately 15 to 25 feet below the ground surface (an elevation ranging from approximately 0 to 5.5 feet NAVD88[6] (GEI Consultants 2014).

Groundwater levels can vary over time in response to environmental, seasonal, and land use changes. For this reason, groundwater levels at the time of construction or in the future could differ from those indicated in previous boring logs (GEI Consultants 2014).

[6] The North American Vertical Datum of 1988. It is a datum used for mean sea level elevations that uses tidal bench marks from Canada, United States and Mexico.

3.2.4 Geology/Soils

3.2.4.1 Regional Geology/Soils

Sacramento and the project site are situated within the Great Valley geomorphic province of California. The Great Valley is a gently-sloping to flat alluvial plain east of the Coast Ranges and west of the Sierra Nevada. It is a northwest-trending structural trough that was formed by the westward tilting of the Sierra Nevada block.

3.2.4.2 Local Geology/Soils

The general vicinity of the project site is reclaimed land that was filled-in in during the 1860's and 1900's. The magnitude of fill material that was placed at that time is unknown (GEI Consultants 2014). According the NRCS Web Soil Survey, the upper 5 feet of the project site is underlain by soils assigned to the following types (Natural Resources Conservation Service 2015; GEI Consultants 2014; ICF International 2015a).

- Orthents-Urban land complex, 0 – 2% slopes (Sacramento County)
- Urban land (Sacramento County)
- Lang sandy loam (Yolo County)
- Lang sandy loam, deep (Yolo County)
- Sycamore silt loam (Yolo County)

Based on the Preliminary Geotechnical and Foundation Report for the project (GEI Consultants 2014), the structure and composition of subsurface soils along the west end of the river embankment were sampled during levee evaluations on the crest and in the vicinity of the West Sacramento levee. The analysis found approximately 15 feet of loose sand and silt in the embankment, which was underlain by an approximately 9-foot layer of clay, followed by an approximately 16-foot layer of sandy silt, and then a 35-foot layer of sand and silt. On the east end of the river embankment, core samples found approximately 6 feet of loose sand with silt underlain by approximately 10 feet of loose sand, followed by approximately 50 feet of sand and silt, which was underlain by an approximately 23-foot layer of medium-dense to very-dense gravel, followed by a clay layer.

3.2.4.3 Soil Erosion Potential

Extensive erosion has occurred from the Sacramento and American Rivers and other tributaries that run across the Central Valley toward the Delta (Ceres 2014). The banks of the Sacramento River channel are particularly vulnerable to erosion during high winter flows. In 1960, the

SRBPP was authorized to help prevent erosion of the Sacramento River banks. The SRBPP evaluates the levees bordering the river to reduce stream bank erosion along the levees and minimize the threat of a flood along the Sacramento River. The USACE, Sacramento District is responsible for implementation of the SRBPP in conjunction with its non-federal partner, the CVFPB. (U.S. Army Corps of Engineers 2015.)

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the RUSLE to predict the average annual rate of soil loss by sheet and rill erosion, in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K at the project site range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. The weighted average soil erodibility K factor for the soils at the project site is 0.27 (U.S. Department of Agriculture 2015) (see Attachment A). Therefore, the potential for erosion at the site is moderate.

3.2.5 Biological Communities

Historically, the Sacramento River was home to a multitude of avian and aquatic species. Development has drastically reduced the size of these populations. Today, the Sacramento River Basin continues to provide habitat for a variety of fish and wildlife but not at the same population sizes as historical conditions. This section provides an overview of existing biological resources in the project vicinity. More details on biological resources can be found in the Natural Environment Study (NES) for the project (ICF International 2015a).

The health of the Sacramento River and its tributaries is critical for the survival of anadromous fish species such as Chinook salmon, steelhead, and sturgeon. Rivers and streams in the upper watersheds are vital for coldwater fish such as native trout. Located along the Pacific Flyway, the marshlands in the Sacramento Valley continue to be an important stop for migrating waterfowl. Both migratory and resident species rely on the state and federal wildlife refuges that exist throughout the Sacramento Basin and on the vast area of irrigated agricultural land.

The Yolo Bypass Wildlife Area is the closest wildlife refuge. It is approximately 7 miles southwest of the proposed project, on I-80 at the Yolo Causeway between Davis and Sacramento.

3.2.5.1 Aquatic Habitat

Special-Status Species

Table 4 presents the special-status aquatic species that could be found in the project vicinity. Currently, no field assessments or surveys have been conducted at the project site to determine whether suitable habitat for these species exists at the site.

Table 4. Federal Endangered and Threatened Species That Occur in or May Be Affected by Projects in the Project Vicinity

Common Name	Scientific Name
Fish	
Green sturgeon	*Acipenser medirostris*
Delta smelt	*Hypomesus transpacificus*
Central Valley steelhead	*Oncorhynchus mykiss*
Central Valley spring-run Chinook salmon	*Oncorhynchus tshawytscha*
Central Valley winter-run Chinook salmon	*Oncorhynchus tshawytscha*
Invertebrates	
Vernal pool fairy shrimp	*Branchinecta lynchi*
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*
Vernal pool tadpole shrimp	*Lepidurus packardi*
Amphibians	
California tiger salamander	*Ambystoma californiense*
California red-legged frog	*Rana draytonii*
Reptiles	
Giant garter snake	*Thamnophis gigas*
Birds	
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*
Least Bell's vireo	*Vireo bellii pusillus*

Source: U.S. Fish and Wildlife Service 2014

Stream/Riparian Habitats

Riparian habitat exists on both the eastern and western banks of the Sacramento River. At this time, this area has not been surveyed, but aerial images confirm the presence of vegetated streambanks.

Wetlands

According to the U.S. Code of Federal Regulations, Title 40, Part 230, entitled "Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material," *special aquatic sites* are defined as the following.

- Sanctuaries and refuges
- Wetlands

- Mud flats
- Vegetated shallows
- Coral reefs
- Riffle and pool complexes

At this time, a survey of the project area has not been conducted, but there is a potential for shallow vegetated wetlands to exist along the banks of the river.

Fish Passage

To comply with Senate Bill 857, a fish passage assessment will be conducted at the project site and will be submitted to CDFW. Any structures blocking anadromous fish passage will be identified immediately to the project engineer for possible design modifications and/or remediation. Modifications and/or remediation on any structures blocking anadromous fish passage will be conducted in accordance with *Fish Passage Design for Road Crossings, an Engineering Document Providing Fish Passage Design Guidance for Caltrans Projects* (California Department of Transportation 2007).

3.3 Water Quality Objectives/Standards and Beneficial Uses

3.3.1 Surface Water Quality Objectives/Standards and Beneficial Uses

Beneficial uses represent the services and qualities of a water body (i.e., the reasons the water body is considered valuable). Water quality in a typical surface water body is influenced by processes and activities that take place within the watershed. Because of the urbanized nature of the project vicinity, surface water quality in the project area is directly affected by storm water runoff from adjacent streets; highways; and properties using fertilizers, pesticides, metals, hydrocarbons, and other pollutants. Typically, pollutant levels in the ocean are highest following the first storm flows of the season, when constituents accumulated during the dry season are flushed into the river.

The Central Valley Regional Water Board has delineated region-wide and water body-specific beneficial uses, and has set numeric and narrative water quality objectives for several substances and parameters in numerous surface waters in its region. Beneficial uses for the Sacramento River are designated in the Central Valley Regional Water Board Basin Plan (Central Valley Regional Water Quality Control Board 2011), as shown in Table 5.

Table 5. Designated Beneficial Uses for the Sacramento River

Water Body	Designated Beneficial Use
Sacramento River (Colusa Basin Drain to I Street Bridge)	Municipal and domestic supply, agricultural (irrigation), contact recreation, non-contact recreation, warm freshwater habitat, cold freshwater habitat, warm freshwater fish migration, cold freshwater fish migration, warm freshwater fish spawning, cold freshwater fish spawning, wildlife habitat, navigation

Source: Central Valley Regional Water Quality Control Board 2011.

3.3.2 Groundwater Quality Objectives/Standards and Beneficial Uses

Beneficial uses of groundwater are designated in the Central Valley Regional Water Board Basin Plan. Unless otherwise designated, all groundwater in the Sacramento Valley is considered suitable, or at a minimum potentially suitable, for the following beneficial uses (Central Valley Regional Water Quality Control Board 2011).

- Municipal and domestic (MUN)
- Agricultural (AGR) – irrigation (IRR) and stock watering
- Industrial process (PROC)[7]
- Industrial service supply (IND)[8]
- Existing water quality

3.4 Regional Water Quality

Water in the Sacramento River Basin is generally considered to be relatively clean and acceptable for a variety of beneficial uses. Because most of the water in the Sacramento River and its major tributaries, such as the Feather and American Rivers, is derived from melting snow that enters the rivers by managed discharges of water from reservoirs, much of the Sacramento River and its large tributaries have low concentrations of dissolved minerals. Although water quality of the Sacramento River is good most of the year, seasonal events—such as agricultural runoff or runoff from historical mining operations—may affect this quality. Some water quality concerns related to these events are listed below (Sacramento River Watershed Program 2015).

- Erosion of stream channels and uplands, and increased turbidity and changes in sediment deposition patterns.
- Rising water temperatures from the loss of riparian canopy cover, streamflow diversions, and waste discharges.

[7] Process is industrial use that depends on water quality.
[8] Service supply is industrial use that is not dependent on water quality.

- Mercury and methylmercury levels from legacy mining sites that can be absorbed into and accumulate in the aquatic food chain.
- Aquatic toxicity from agricultural chemical use, including organophosphate pesticides in the Sacramento Valley.

3.4.1 List of Impaired Waters

Table 6 shows Section 303(d)-listed impairments for the Sacramento River based on the 2010 California Integrated Report (State Water Resources Control Board 2011).

Table 6. Section 303(d)-Listed Impairments for the Sacramento River

Reach	Section 303(d)-Listed Impairments	Source	TMDL Completion
Sacramento River (Knights Landing to the Delta)	Chlordane	Agriculture	Est. 2021
	DDT (dichlorodiphenyltrichloroethane)	Agriculture	Est. 2021
	Dieldrin	Agriculture	Est. 2021
	Mercury	Resource extraction	Est. 2012
	PCBs (polychlorinated biphenyls)	Unknown	Est. 2021
	Unknown toxicity	Unknown	Est. 2019

TMDL = total maximum daily load
Source: State Water Resources Control Board 2011

3.4.2 Construction General Permit Risk Level Assessment

Beneficial uses and status of impaired water bodies are used to determine permit requirements. A construction site risk level assessment was performed for the project Storm Water Pollution Prevention Plan (SWPPP), with a resultant **Risk Level 2 (**medium level**)**. The risk level was determined based on the procedure described in the Construction General Permit and based on two major elements: (1) project sediment risk (the relative amount of sediment that can be discharged, given the project and location details); and (2) receiving water risk (the risk that sediment discharges pose to the receiving waters). Project sediment risk is determined by multiplying the R, K, and LS factors from the Revised Universal Soil Loss Equation (RUSLE) to obtain an estimate of project-related bare ground soil loss expressed in tons/acre. Receiving water risk is based on whether a project drains to a sediment-sensitive water body. A *sediment-sensitive water body* is on the most recent Section 303d list for water bodies impaired for sediment; has a U.S. Environmental Protect Agency- (EPA-) approved total maximum daily load (TMDL) implementation plan for sediment; or has the beneficial uses of COLD, SPAWN, and MIGRATORY. More details on how the risk level was determined are provided in Attachment A.

Tables 7 and 8 summarize the sediment and receiving water risk factors and document the sources of information used to derive the factors.

Table 7. Summary of Sediment Risk

RUSLE Factor	Value	Method for Establishing Value
R	105	EPA website: http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm.
K	0.14	Weighted average for surface layer of soil map units
LS	0.20	Field observations and LS Table from Sediment Risk Factor Worksheet in General Permit. Calculation assumes 1% slope (based on Natural Resources Conservation Service data) and 300-foot slope length.
Total predicted sediment loss (tons/acre)		2.94
Overall Sediment Risk Low sediment risk = < 15 tons/ acre Medium sediment risk = > 15 and < 75 tons/acre High sediment risk >= 75 tons/acre		☒ Low ☐ Medium ☐ High

RUSLE = Revised Universal Soil Loss Equation

Table 8. Summary of Receiving Water Risk

Receiving Water Name	303(d) Listed for Sediment-Related Pollutant[a]	TMDL for Sediment-Related Pollutant[a]	Beneficial Uses of COLD, SPAWN, and MIGRATORY[a]
Sacramento River	☐ Yes ☒ No	☐ Yes ☒ No	☒ Yes ☐ No
Overall receiving water risk			☐ Low ☒ High

[a] If "yes" is selected for any option, the receiving water risk is high.

3.4.3 Areas of Special Biological Significance

The proposed project is not within the vicinity of an Area of Special Biological Significance, as designated by the State Water Board (State Water Resources Control Board 2015).

Chapter 4 Environmental Consequences

4.1 Introduction

This chapter describes potential impacts on hydrology and water quality that could result from the proposed project. Construction activities may result in short-term impacts, such as the input of sediment loads and spills into water bodies. Long-term impacts include the increased potential for polluted runoff into water bodies. The chapter identifies the impacts of the project to the extent that they are reasonably foreseeable given the general level of project detail that is available at this time. Figure 2 shows the proposed bridge project and associated roadway alternatives, as well as the existing bridge and proposed removal of existing roadway approach structures.

4.2 Potential Impacts on Water Quality

The WQAR describes project-induced effects on water quality. For the purpose of this report, an impact is considered adverse if the proposed project would result in any of the following.

- Violate water quality standards or waste discharge requirements.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite.
- Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.
- Otherwise substantially degrade water quality.
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

- Place within a 100-year flood hazard area structures that would impede or redirect flood flows.
- Expose people or structures to inundation by seiche or tsunami.

Short-term or temporary construction impacts on water quality have the potential to occur during grading, demolition, and construction related to the proposed replacement of the I Street Bridge. Potential sources of water pollution associated with the project include storm water runoff containing sediment from soil erosion, petroleum and wear products from motor vehicle operation, and accidental spills of hazardous materials during construction activities. Contaminants in runoff from the new bridge could include sediment, oils and grease, and heavy metals. Implementation of commonly used construction activity best management practices (BMPs) is anticipated to minimize any potential impacts on water quality to the maximum extent practicable. Post-project drainage would be designed so as not to be altered from pre-project drainage, and drainage would be directed to the storm drain system.

4.2.1 Anticipated Changes to the Physical/Chemical Characteristics of the Aquatic Environment

4.2.1.1 Substrate

In-channel construction and maintenance activities for the proposed bridge may alter the structure and composition of the river bed (or substrate). In-water construction work such as installation of temporary cofferdams and pile driving would disturb the bottom substrate over the stiff clay layer in the Sacramento River channel, which could remobilize sediments as well as contaminants adsorbed to the sediments. Non-soluble contaminants with a tendency to adsorb to sediments (as opposed to soluble contaminants, which have the tendency to be readily diluted in water) can accumulate in the substrate over time. Non-soluble contaminants that are known to be present in the Sacramento River include polychlorinated biphenyls (PCBs), mercury, pesticides and insecticides (i.e., dieldrin, chlorodane, DDT), and other unknown toxicities (State Water Resources Control Board 2011). The resuspension of contaminants found in bottom substrate can remobilize these contaminants and release them into the water column, degrading water quality. In addition, resuspended particulate material could be transported to other locations in the Sacramento River as a result of flow patterns and tidal currents, thus leading to potential degradation of water quality beyond the immediate project area.

4.2.1.2 Currents, Circulation, or Drainage Patterns

The proposed project may affect the water volume, depth, and flow rate in the Sacramento River, as well as surface drainage patterns during construction and operation of the project.

Proposed Bridge

The hydrologic study conducted for the project (MBK Engineers 2015) demonstrates that the proposed bridge would cause a negligible increase in the peak water surface elevation (WSE) of 0.02 foot immediately upstream and a negligible decrease in WSE from 0.06 to 0.07 foot for all three flood events evaluated (50-year, 100-year, and 200-year). Because changes in the water surface profile (water depth) would be negligible, the new bridge would cause virtually no impacts on the river hydraulics or floodplain of the Delta.

Roadway Modifications

During construction, utility improvements would involve relocation of some storm drains within Jibboom Street, Bercut Drive, C Street, and 2nd Street, which could temporarily affect the ability of water to drain in the surrounding area during a rain event. However, drainage would be re-routed to other active storm drain inlets during relocation activities. As is standard with all construction projects, the contractor would be required to install temporary BMPs to protect existing drainage inlets and storm drain systems and to control any runoff or erosion from the project site that may discharge into the surrounding waterways.

During operation, new impervious surface and changes in topography could alter surface runoff drainage patterns and river flows. However, project drainage has been considered in the design. As described in Section 1.1.3.4, the proposed roadway drainage would be conveyed to the existing storm drain system installed within Railyards Boulevard and C Street. Railyards Boulevard currently drains storm water to the east along the roadway and then into a retention basin south of Railyards Boulevard. C Street drains storm water west along the roadway and then ultimately south beyond the project limits. Drainage from the bridge itself would be directed to drains located on the bridge and routed to the abutment, where it would enter the storm drainage system.

4.2.1.3 Suspended Particulates (Turbidity)

During construction, potential short-term increases in turbidity would result from soil erosion and suspended solids being introduced into the Sacramento River, from both in-water and land construction activities. This could violate water quality standards or WDRs related to turbidity and have the potential to result in physiological, behavioral, and habitat effects on aquatic life (ICF International 2015a).

Proposed Bridge

In-water construction activities in the Sacramento River would directly disturb sediment along the river bed and result in a temporary increase in turbidity in the immediate project area and potentially downstream. The potential for disturbance of riverbed sediments and associated increases in sedimentation and turbidity in the Sacramento River are anticipated to be greatest during extraction of temporary trestles and cofferdams installed during in-water work for bridge construction. These activities would result in greater disturbance to riverbed sediments than would occur during pile driving for piers and the bridge fender system; these piles would be driven only and not extracted (ICF International 2015a).

Dewatering may be needed for (1) removal of water from within the CIDH piles after they complete pile driving and prior to pouring the concrete inside the CIDH pile cage; and/or (2) removal of the water that is displaced as the concrete is poured.

The first instance involves partial or complete dewatering without any new contaminants. The discharge of turbid water would be prevented by filtering the discharge first using a filter bag, diverting the water to a settling tank or infiltration area, and/or treating the water in a manner to ensure compliance with water quality requirements prior to discharging water back to the Sacramento River or any canal, ditch, wetland, or other aquatic habitat. This type of dewatering would occur if the casings were dewatered partially before pouring concrete or if cofferdams are used and dewatering is needed to rescue fish. If casings remain on for at least 1–2 days after the work is completed, sediments would settle in the casings before the casings are pulled.

The second instance requires preventing the discharge of concrete to Sacramento River by diverting and properly disposing of water displaced from within CIDH piles as concrete is being poured. The water likely would contain uncured concrete. A Low-Threat Dewatering Permit would not be needed if the water within the encasements that comes in contact with the cement is pumped out, placed in a container, and hauled to a hazardous waste facility where it would be properly treated and disposed. However, if it is discharged to the Sacramento River or nearby storm drains, monitoring and treatment of constituents associated with concrete (e.g., pH, hardness) would need to be conducted in compliance with the conditions of the Low-Threat Dewatering Permit prior to discharge. If the water is discharged to land, such as to temporary infiltration basins, the project would need to obtain a General Dewatering Permit for Land Discharges. For example, water could be treated and neutralized within Baker Tanks then allowed to infiltrate in basins or used for dust control.

Roadway Modifications

Construction activities occurring on land adjacent to the river channel could cause erosion of sediments and contribute to short-term increases in turbidity in the river. Land-disturbing activities (e.g., vegetation clearing, excavation, and grading) could result in erosion and subsequent soil deposition to the river, which would increase river turbidity. Table 9 lists the acreages of each land cover type in the biological study area[9] (as described in the NES for the project) that would be permanently or temporarily affected by the proposed project, and Figure 5 shows these areas in a map series for reference. As shown in the table, the proposed project with West Sacramento Residential Access Alternative 1 would result in slightly more developed/ graded land disturbance than the proposed project with West Sacramento Residential Access Alternative 2. There are no impact acreage differences as a result of the City of Sacramento roadway design alternatives.

Table 9. Permanent and Temporary Impacts on Land Cover Types in the Biological Study Area

Land Cover Type	Proposed Project with West Sacramento Residential Access Alternative 1[a]		Proposed Project with West Sacramento Residential Access Alternative 2[a]	
	Permanent and Indirect Impact Area (acres)	Temporary Impact Area (acres)	Permanent and Indirect Impact Area (acres)	Temporary Impact Area (acres)
Cottonwood riparian forest[b]	2.49	1.93	1.45	1.66
Riparian forest/shrub wetland[b]	0.07	0.11	0	0
Tidal perennial drainage[b]	0.53	3.60	0.53	3.60
Ruderal woodland	2.01	1.70	2.01	1.70
Landscaped	0.63	0.70	0.54	0.63
Developed/graded	8.18	6.55	7.70	6.36
Total	13.91	14.59	12.23	13.95

[a] There are no impact acreage differences as a result of the City of Sacramento roadway design alternatives.
[b] These are natural communities of special concern.
Source: ICF International 2015a.

Construction of the proposed project would disturb more than 1 acre of land. Because the project is on and adjacent to the Sacramento River, Construction General Permit SWPPP erosion and sediment control BMPs would be implemented to prevent or minimize sediment and suspended solids from entering the river.

During operation, long-term water quality impacts are attributable to changes in storm water drainage and/or loss of riparian vegetation. The proposed project would result in a permanent loss of 1.88 acres of levee slope vegetation (1.13 acres in West Sacramento and 0.75 acre in

[9] The biological study area includes all areas of proposed permanent and temporary impacts, as well as the area under I-5 and adjacent to the proposed removal of roadway approach structures in the City of Sacramento and parcels adjacent to some of the proposed road improvements in the City of West Sacramento.

Sacramento) for RSP and permanent structures. Vegetation along slopes can help reduce the potential for erosion during rain events.

The proposed project would result in added impervious surface that would have the potential to increase runoff volume in the Sacramento River. Increases in impervious surfaces change the storm hydrograph by increasing flow velocity and the peak and quantity of storm runoff due to reduced natural infiltration (groundwater recharge) and uptake from native soils and vegetation. Further, if periodic maintenance of the bridge were to require in-water work, there would be the potential for sediment disturbance and turbidity. The project design will incorporate Construction General Permit SWPPP post-construction measures, site design measures, LID measures, and other permanent erosion control elements found in Caltrans' MS4 program guidance documents, Sacramento Stormwater Quality Partnership's SQIP, and the City of West Sacramento's SWMP, to ensure that storm water runoff does not cause soil erosion. Implementation of these measures would reduce or avoid permanent impacts on water quality.

4.2.1.4 Oil, Grease, and Chemical Pollutants

The use of heavy construction equipment or construction-related materials or post-construction roadway operations can introduce pollutants of concern or toxic chemicals to the project site, which has the potential to violate water quality standards or WDRs. In addition, some of these pollutants can accumulate in stream sediments with lethal and sublethal consequences for fish and other aquatic species, particularly during "first-flush" rain events (ICF International 2015a).

Proposed Bridge

Construction chemicals may be accidentally spilled into watercourses during in-water work. A typical construction site uses many chemicals or compounds, including gasoline, oils, grease, paint, solvents, lubricants, and other petroleum products. Many petroleum products contain a variety of toxic compounds and impurities; they tend to form oily films on the water surface, altering oxygen diffusion rates. Concrete, soap, trash, and sanitary wastes are other common sources of potentially harmful materials at construction sites. Washwater from equipment and tools and other waste accidently spilled on the construction site can lead to introduction of pollutants into surface waters or seepage into groundwater. The impact of toxic construction-related materials on water quality depends on the duration and time of activities. Construction occurring in the dry season is less likely to cause soil and channel erosion or runoff of toxic chemicals into a stream. However, low summer flows are less able to dilute pollutants that do enter the watercourse.

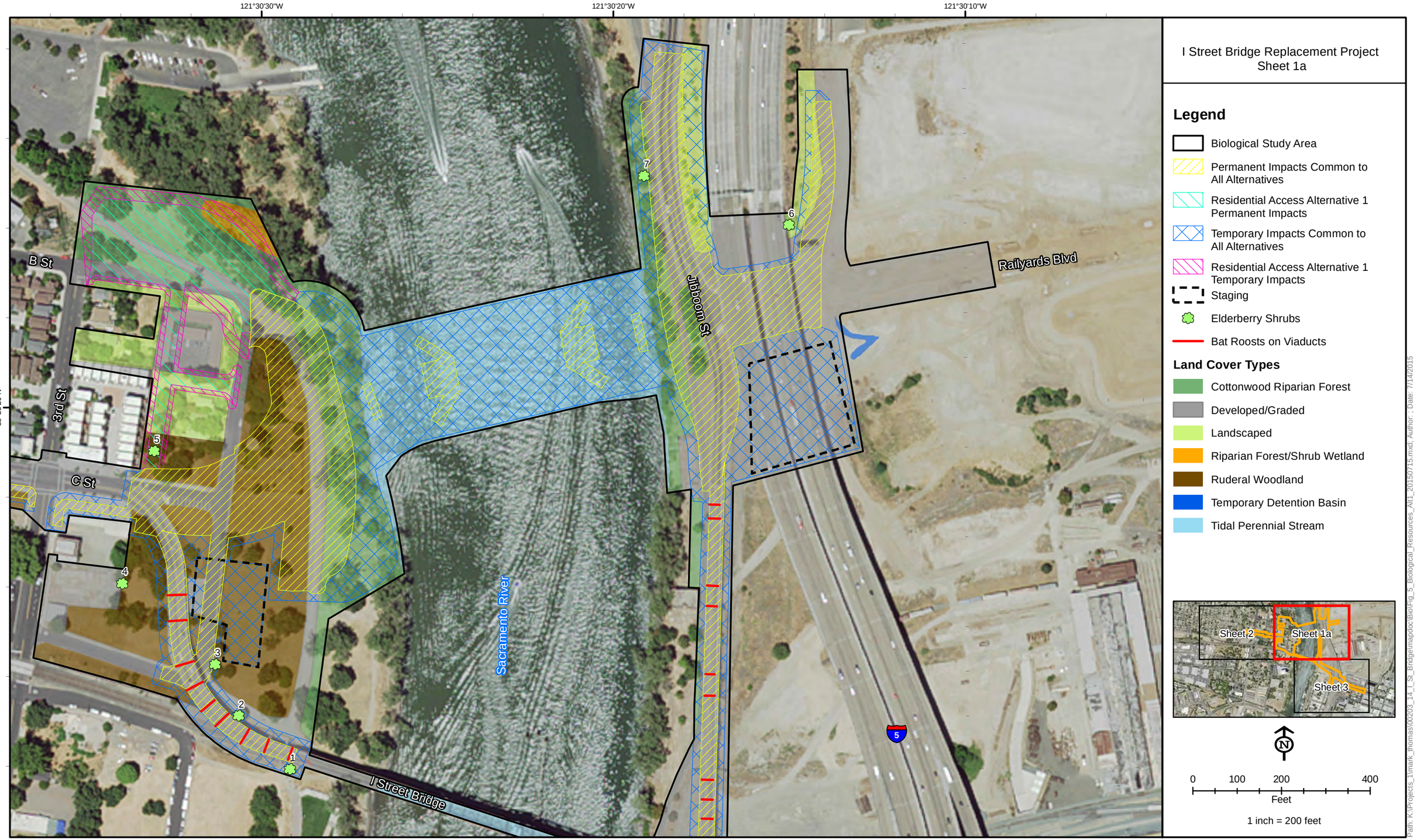


Figure 5
Impacts on Landcover Types and Sensitive Biological Resources in the Biological Study Area

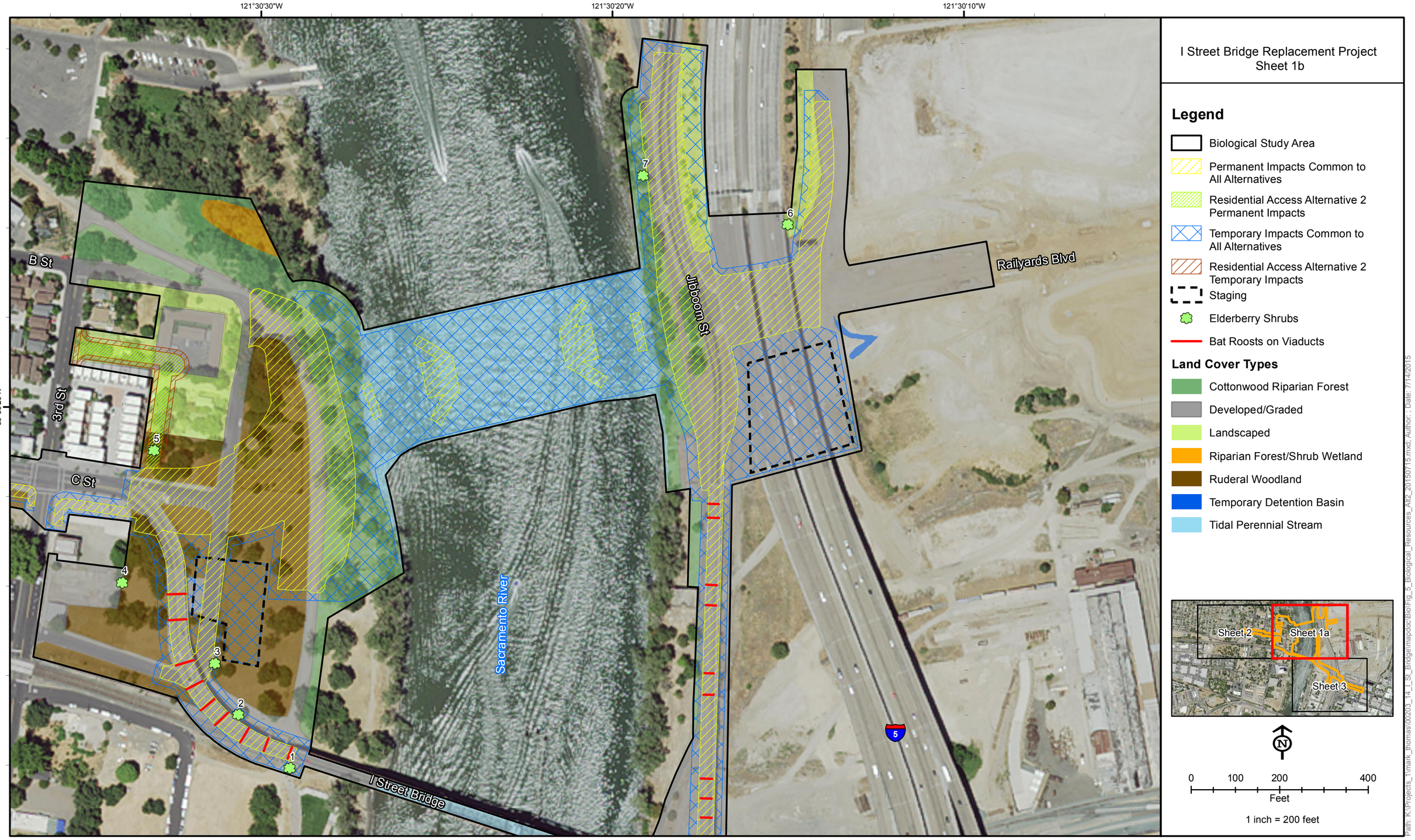


Figure 5
Impacts on Landcover Types and Sensitive Biological Resources in the Biological Study Area

121°31'0"W

121°30'50"W

121°30'40"W

38°35'20"N

B St

Metro Lane

C St

5th St

4th St

6th St

Sacramento Ave

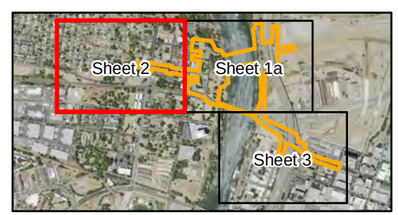
I Street Bridge Replacement Project
Sheet 2

Legend

- Biological Study Area
- Permanent Impacts Common to All Alternatives
- Temporary Impacts Common to All Alternatives

Land Cover Types

- Developed/Graded
- Landscaped
- Ruderal Woodland



N

0 100 200 400
Feet

1 inch = 200 feet

Path: K:\Projects_1\mark_thomas\02203_14_1_St_Bridge\mapdoc\Bio\Fig_5_Biological_Resources_Alt1_20150715.mxd, Author: , Date: 7/14/2015

Figure 5
Impacts on Landcover Types and Sensitive Biological Resources in the Biological Study Area

Figure 5
Impacts on Landcover Types and Sensitive Biological Resources in the Biological Study Area

Roadway Modifications

Heavy metals, oil, grease, and polycyclic aromatic hydrocarbons are common pollutants in road runoff, and roadside landscaping can introduce pesticides and fertilizers. These pollutants are typically washed off the roadway surfaces by rainfall and enter storm water runoff. Urban runoff from vehicles on bridges can be discharged into streams during rain events, in vehicle accidents, and through normal wear and tear. Runoff in significant quantities occurs only during heavy storms that in turn cause these pollutants to be greatly diluted. These storms cause some high flows in the drainage systems, which dilute the pollutants as they are carried from the source.

The construction contractor would be required to regularly inspect and maintain the BMPs to ensure that they are in good working order, as required in the Construction General Permit SWPPP. The contractor would implement appropriate hazardous material management practices, spill prevention, and other good housekeeping measures to reduce the potential for chemical spills or releases of contaminants, including any non-storm water discharge to drainage channels. Implementation of these measures would minimize the potential for surface water and groundwater contamination.

Overall, post-construction bridge and roadway runoff is not expected to adversely affect water quality in the Sacramento River, as runoff would be collected and diverted via ducts and culverts to a storm drain system rather than to the river itself.

4.2.1.5 Temperature, Oxygen Depletion, and Other Parameters

Changes in temperature, dissolved oxygen levels, or other parameters of a water body could violate water quality standards or WDRs. These changes could cause algal blooms and adversely affect sensitive aquatic life. Low dissolved oxygen levels can be the result of algal blooms.

Proposed Bridge

Temperature can be affected if water of a different temperature is discharged directly into waters or if water depths are substantially changed in a river, resulting in seasonal changes in air temperature and solar radiation with a greater (with lower water levels) or lesser (with greater water levels) influence on river water temperatures. Vegetative canopy cover (overhanging vegetation) maintains cooler temperatures in the underlying water. Removal of streamside vegetation may affect water temperatures. In addition, new overwater structures, such as the new bridge, could alter underwater light conditions and resulting water temperatures. Because of the height of the new bridge over the water, ambient light levels generally would be expected to penetrate into the water, thereby minimizing the effect of bridge shading on aquatic habitats in the Sacramento River.

Low river flows (or stagnant water) and algal blooms can affect dissolved oxygen levels. Neither of these conditions are expected to occur as a result of the project. In addition, the Sacramento River is not impaired for dissolved oxygen or temperature; therefore, these parameters are not likely to result in levels detrimental to aquatic life as a result of the project.

Remobilization of nutrients found in bed sediments during construction could release increased nutrients into the water column, causing an algal bloom. However, remobilization of these nutrients would be temporary and would not be in quantities large enough to cause algal blooms in the river due to its continual flow.

Roadway Modifications

Landscaping activities for roadside vegetation could include the use of pesticides, herbicides and fertilizers. Landscaping runoff can be discharged in nearby storm drains or via runoff directly into the Sacramento River. As shown in Table 8, the Sacramento River is impaired for pesticides (chlordane, DDT, and dieldrin). In addition, fertilizers can be a source of nutrients that could cause algal blooms. Pesticides and fertilizers, if used on riparian or roadside vegetation, would be properly applied according to the regulations of the California Department of Pesticide Regulation to ensure that waterways are not exposed.

4.2.1.6 Flood Control Functions

As previously described in Section 3.2.3, under "Flood Plains," the project site is located within the 100-year Flood Zone AE and Flood Zone X (unshaded) or C, which is an area of minimal flood hazard. Bridge structures within a 100-year flood hazard area could impede or redirect flood flows. In addition, alteration of drainage patterns of the site or area, including through the alteration of the course of a stream or river, could result in flooding onsite or offsite.

Proposed Bridge

According to the Preliminary Hydraulic Impact Analysis for the project (MBK Engineers 2015), the new bridge would be designed according to the following criteria defined in the California Department of Water Resources' (DWR's) FloodSafe California Urban Levee Design Criteria.

- Levees protecting urban areas are assumed to have a minimum crown elevation equal to the 1-in-200 Azimuth-over-Elevation Positioning (AEP) WSE plus 3 feet.
- Non-urban state/federal project levees are assumed to meet the authorized minimum elevation.
- Levees act as weirs and do not breach if overtopped.

The bridge design was analyzed for impacts from the 200-year flood (Q200), 100-year flood (Q100) and the 50-year flood (Q50). It was found that the proposed bridge results in a negligible increase in the peak WSE of 0.02 foot immediately upstream of the Project for all three of the flood events evaluated. Downstream of the project, there is a 0.06- to 0.07-foot reduction in the peak WSE. The reduction in WSE downstream of the project is due to a reduction in the peak flow in the Sacramento River downstream of the American River that is caused by the small increase in the WSE upstream of the project. The increase in WSE upstream of the project translates to an increase at the American River, thereby reducing the percentage of American River flow that goes downstream in the Sacramento River and increasing the percentage that flows upstream to the Sacramento Weir. As with the effect on the WSE, the effect on the flows is negligible.

In addition to DWR's FloodSafe California Urban Levee Design Criteria, the new bridge would be designed according to hydraulic design criteria established in the Caltrans Local Assistance Procedures Manual. The criteria dictate that the facility be capable of conveying the base or Q100 and passing the Q50 "without causing objectionable backwater, excessive flow velocities or encroaching on through traffic lanes." The same criteria also recommend a minimum freeboard clearance of 2 feet above the 50-year floodwater surface elevation (WSE50) to provide clearance for drift. Due to the potential for significant drift during high flows in this channel, increasing the freeboard clearance to 3 feet above the WSE50 is reasonable.

Roadway Modifications

Roadway improvements are not expected to increase flood risk because (1) new impervious area is expected to be minimal; (2) drainage system improvements would be designed to accommodate storm drain infrastructure capacities and prevent ponding; and (3) the roadways would be at-grade and therefore would not obstruct or redirect flood flows.

4.2.1.7 Storm, Wave, and Erosion Buffers

The proposed project is not located within a tidally-influenced area nor a wetland. It is located approximately 80 miles inland from the coast and therefore would not be vulnerable to large storm waves that typically threaten coastline areas. The proposed project would not change the potential for storm waves to affect upland areas or existing erosion buffers (i.e., wetlands).

4.2.1.8 Erosion and Accretion Patterns

Proposed Bridge

Accretion refers to the gradual accumulation of sediments along channel banks via the deposit, by water, of solid material—whether mud, sand, or other sediments due to factors such as channel geomorphology and flow obstructions. Because the proposed project is located in an area primarily composed of dense and compact soil that is not easily erodible, accretion is not expected to occur.

Sedimentation is the tendency for particles in suspension to settle out of the fluid in which they are entrained and to come to rest against a barrier. Larger particles like gravel and sand settle out more rapidly than fine particles like silt and clay. The Preliminary Hydraulic Impact Analysis for the project (MBK Engineers 2015) evaluated the potential for debris loading on the piers. In accordance with guidance provided by the CVFPB for hydraulic analyses, the debris loading was assumed to be 2 feet in depth for a width twice the width of the pier. Potential impacts of the proposed project on erosion patterns also are discussed in Section 4.2.1.3, Suspended Particulates (Turbidity).

Roadway Modifications

Land disturbance activities, such as grading and excavation during construction, would loosen the soil and could remove the protective cover of vegetation, thereby reducing the natural soil resistance to rainfall impact erosion.

As noted above, implementation of erosion and sediment control BMPs during construction would prevent or minimize sediment and suspended solids from entering the river. The project design also will include permanent erosion control elements to ensure that storm water runoff does not cause soil erosion, thus reducing or avoiding permanent impacts on water quality.

4.2.1.9 Aquifer Recharge/Groundwater

Proposed Bridge

Construction activities related to installing bridge columns may require groundwater dewatering should groundwater be encountered below the riverbed and along the bridge landings. The piles would be driven to a depth of approximately 70 feet below the original ground elevation. As previously mentioned, a Low-Threat Dewatering Permit would not be needed if the water within the encasements that comes in contact with the cement is pumped out, placed in a container, and hauled to a hazardous waste facility where it would be properly treated and disposed. However, if it is discharged to the Sacramento River or nearby storm drains, monitoring and treatment of

constituents associated with concrete (e.g., pH, hardness) would need to be conducted in compliance with the conditions of the Low-Threat Dewatering Permit prior to discharge.

Roadway Modifications

As previously described, groundwater was found at a depth of approximately 15 to 25 feet below the ground surface. Roadway improvements and utility installation and trenching would require excavation to depths of only a few feet.

Should the proposed project require groundwater dewatering during construction activities, groundwater resources would be minimally affected because the required excavations would intersect only the shallow water table on a temporary basis during the construction period. Although this could result in short-term, localized alterations in groundwater levels near the surface in the immediate vicinity of the construction site, the reduction would not cause a widespread, regional drawdown and likely would be quickly recharged due to saturated groundwater characteristics. Changes to groundwater occurrence and levels due to project construction and operation, if groundwater levels are affected at all, would not detrimentally affect regional groundwater production or change the existing water quality. Groundwater dewatering would not be necessary for project operation and maintenance activities.

As previously described, the majority of water supply comes from surface water sources, not groundwater resources. Water used during project construction may be trucked in or extracted from nearby fire hydrants, and the use would be temporary. In addition, the project would not need continual water supplies for operation and maintenance activities. Therefore, groundwater levels would not be affected from water used during project construction or operation.

4.2.1.10 Baseflow

Baseflow is the portion of streamflow that comes from groundwater seepage during a drought or after an extended dry period with little rain to replenish the stream. During periods of low surface flow (dry season), the shallow groundwater table can play a large role in providing baseflows to the Sacramento River. As previously described, the proposed project would not affect groundwater levels on a long-term basis, if at all, and therefore would not affect the baseflow levels in the Sacramento River during the dry season.

4.2.2 Anticipated Changes to the Biological Characteristics of the Aquatic Environment

The following section addresses biological resources that may be affected by the proposed project and is based on the project NES (ICF International 2015a).

4.2.2.1 Special Aquatic Sites

Special aquatic sites, referred to as *environmentally sensitive areas*, would be protected with barrier fencing or stakes during construction, and would be identified on the construction plans (ICF International 2015a). Please see the project NES (ICF International 2015a) for more information regarding potential impacts of the project on environmentally sensitive areas.

4.2.2.2 Habitat for Fish and Other Aquatic Organisms

The proposed project would result in the temporary and permanent loss of aquatic habitat area and volume, including foraging and rearing habitat for juvenile winter-run Chinook salmon (ICF International 2015a).

Installation of sheet pile cofferdams to isolate the in-water construction areas for piers 2 and 5 from the water column during pier construction would result in the temporary loss of aquatic habitat (substrate and water column) equal to the enclosed area and volume of the in-water cofferdams. The proposed dimensions of each cofferdam are 25 feet by 80 feet, or 2,000 square feet. Together, the two cofferdams would result in a temporary loss of 4,000 square feet (0.09 acre) of substrate habitat and up to 73,640 cubic feet of water column habitat below the OHWM (based on a water surface elevation of +20 feet).

In addition, installation of the new bridge piers (piers 2–5) and piles for the new bridge fender system would result in the permanent loss of aquatic habitat (substrate and water column) equal to the cumulative area (substrate) and volume (water column) of the in-water piers and bridge fender piles. Similarly, placement of rock revetment (rip-rap) around the new bridge piers and on the waterside slope of the existing levees below the OHWM would result in the permanent loss of natural substrate habitat equal to the net increase in area of rock revetment.

Installation of these features may result in direct and indirect effects by inhibiting establishment of riparian vegetation; inhibiting recruitment and retention of sediment and woody debris; and eliminating shallow, low-velocity river margins preferred by juvenile fish.

Compensation for impacts on critical habitat, as described in the project NES (ICF International 2015a), would offset the effects of permanent impacts on the substrate and water column resulting from construction of the new bridge piers.

Avoidance and minimization measures described in the project NES (ICF International 2015a) would further avoid or minimize the potential for construction-related effects on aquatic habitat in the project area.

4.2.2.3 Fish Passage (Beneficial Uses)

Fish passage may be limited during in-water construction work, but obstructions would be temporary. All in-water construction work and pile driving (in-water and shore-based within 250 feet of the Sacramento River), installation of cofferdams, removal of temporary sheet piles, and placement of rock revetment would be conducted during the time periods allowed by the regulatory agencies to avoid or minimize causing disturbance and injury to, or mortality of, special-status fish species in the affected reaches of the Sacramento River. In addition, in-water work would be conducted during daylight hours only to provide fish in the affected reaches of the Sacramento River with an extended quiet period during nighttime hours for feeding and unobstructed passage. (ICF International 2015a).

Avoidance and minimization measures described in the project NES (ICF International 2015a) would further avoid or minimize the potential for construction-related effects on fish passage in the project area.

4.2.2.4 Wildlife Habitat

Wildlife habitat would be protected from temporary impacts with avoidance measures (i.e., seasonal restrictions) and fencing around the project area to prevent the presence of wildlife in the construction site.

Avoidance and minimization measures described in the project NES (ICF International 2015a) would further avoid or minimize the potential for construction-related effects on wildlife habitat in the project area.

4.2.2.5 Wildlife Passage (Beneficial Uses)

Wildlife passage may be temporarily limited due to fencing around the project site to prevent the presence of wildlife in the construction site, but passage would not be inhibited post-project. In addition, removal or replacement of riparian areas may affect trees that would support birds, such as Swainson’s hawk.

Avoidance and minimization measures described in the project NES (ICF International 2015a) would further avoid or minimize the potential for construction-related effects on wildlife passage in the project area.

4.2.2.6 Endangered or Threatened Species

The project could result in the potential loss or disturbance of nesting species state listed as threatened. Special-status species potentially affected by the project include the state-listed

Swainson's hawk (*Buteo swainsoni*) and the CDFW fully protected white-tailed kite (*Elanus leucurus*). Green sturgeon (*Acipenser medirostris*) was classified as a Class 1 Species of Special Concern by CDFW in 1995 (Moyle et al. 1995). Class 1 Species of Special Concern are those that conform to the State definitions of threatened or endangered and could qualify for addition to the official list. Elderberry shrubs that represent habitat for the federally threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) could be affected by the project, which could result in injury to or mortality of beetles. The project also could affect habitat for the delta smelt (federally listed as threatened) based on temporary effects on water quality (increased turbidity and suspended sediment), rearing and movement habitat (noise and shade), and channel substrates (cofferdams and temporary trestles); temporary and permanent effects on riparian and shaded riverine aquatic cover habitat (vegetation removal, bridge and bike path construction); and permanent effects on aquatic habitat (construction of bridge piers, shade, and placement of RSP) in the Sacramento River.

Avoidance and minimization measures described in the project NES (ICF International 2015a) would further avoid or minimize the potential for construction-related effects on endangered or threatened species in the project area.

4.2.2.7 Invasive Species

During construction, the operation of barges and other in-water equipment originating from outside the project area could result in the introduction and spread of aquatic invasive species, including the Asian overbite clam (*Corbula amurensis*), quagga mussel (*Dreissena bugensis*), zebra mussel (*Dreissena polymorpha*), hydrilla (*Hydrilla verticillata*), and Brazilian elodea (*Egeria densa*) (California Department of Fish and Game 2008).

The proposed project has the potential to create additional disturbed areas for a temporary period and to introduce and spread invasive plant species to uninfected areas within and adjacent to the project area. This would be of particular concern for natural communities of special concern, where non-native invasive plants could outcompete and replace native vegetation. No plant species designated as federal noxious weeds have been identified in the project area (ICF International 2015a).

Avoidance and minimization measures described in the project NES (ICF International 2015a) would avoid or minimize the potential for project-related effects due to the introduction and spread of invasive aquatic and plant species in the project area.

4.2.3 Anticipated Changes to the Human Use Characteristics of the Aquatic Environment

This section addresses the potential effects of the proposed project on human use characteristics, including beneficial uses of the Sacramento River.

4.2.3.1 Existing and Potential Water Supplies; Water Conservation

The project would not require the use of water supplies and therefore would not affect beneficial uses of the Sacramento River related to municipal and domestic, industrial process and service, and agricultural water supplies.

4.2.3.2 Recreational or Commercial Fisheries

The project would affect only a small section along the Sacramento River, would not affect fishery supplies, and therefore would not affect recreational or commercial fisheries. Consequently, the proposed project would not affect beneficial uses of the Sacramento River related to non-contact water recreation (i.e., fishing).

4.2.3.3 Other Water-Related Recreation

Boating and other water recreation activities are common in the Sacramento River. The new bridge would be designed so as not to affect the ability of boaters, water skiers, and swimmers to use the river. Therefore, the proposed project would not affect the beneficial use of the Sacramento River related to water contact recreation.

4.2.3.4 Aesthetics of the Aquatic Ecosystem

Please see the project Visual Impact Assessment (ICF International 2015a) for a more detailed discussion of the visual and aesthetic changes of the proposed project. The new bridge would change the aesthetics of the project area, including the aesthetics of the aquatic ecosystem. The largest visual change would be the introduction of a new bridge across the Sacramento River. The new bridge would be visible from the river's edge at public access points like the Broderick Boat Ramp. The new bridge would also be visible by those standing at the water's edge, boaters on the river, rail passengers crossing the existing I Street Bridge, and pedestrians on the water intake's public promenade. In addition, new RSP added to prevent erosion near the bridge would be visible along the shoreline. Thee RSP would weather and darken, and would appear similar to other RSP installations along the river. The aesthetic change would be localized and the proposed project would have a minimal impact on the aesthetics of the aquatic system.

4.2.3.5 Parks, National and Historic Monuments, National Seashores, Wild and Scenic Rivers, and Wilderness Areas

The Sacramento River is not a designated Wild and Scenic River, nor is it designated as a national or historic monument or located in a wilderness area. No national and historic monuments, national seashores, or wilderness areas are located in the project area. There are parks along each bank of the river near the proposed project: Sacramento River Parkway in Sacramento, and River Walk Park and Broderick Boat Ramp in West Sacramento. Access to the Broderick Boat Ramp by land or river would not change during project construction. Replacement of the bridge would temporarily affect the Sacramento River Parkway and the Class I trail that runs along the river bank in the parkway. A trail detour would be required in order to construct the new bridge landing on the Sacramento bank of the river. Also, access to a path that connects River Walk Park to undeveloped land north of the existing I Street Bridge would be temporarily affected. Because these impacts would be temporary, the proposed project would result in a limited impact on resources associated with special designations.

4.2.3.6 Energy Consumption or Generation

No hydropower facilities are located in the project area, and construction and operation of the proposed project would not require high consumption of energy. Therefore, the proposed project would not affect energy consumption or generation capabilities.

4.2.3.7 Navigation

As described in Section 1.1.3, Project Alternatives, the Sacramento River is considered to be a navigable waterway of the United States. Under the provisions of the General Bridge Act of 1946, as amended, the proposed location and plans for bridges over navigable waters of the United States must be approved by the U.S. Coast Guard, prior to commencing construction. In order to comply with the U.S. Coast Guard requirement to maintain navigation along the river, the new bridge would be a movable bridge. The bridge design has been developed to accommodate river boat traffic and navigation under the existing I Street Bridge and the proposed bridge and therefore would not impede riverine navigation.

4.2.4 Short-Term Impacts during Construction

4.2.4.1 Physical/Chemical Characteristics of the Aquatic Environment

Short-term or temporary construction impacts on water quality could occur during grading, demolition, and other construction activities related to the proposed project. Construction activities would comply with a variety of restrictions and agency requirements, such as permits

from the Central Valley Regional Water Quality Control Board, USACE, and CDFW. Implementation of the SWPPP, and the performance standards of Caltrans and Sacramento and Yolo County storm water ordinances would minimize the potential for construction-related surface water pollution—and would ensure that water quality in the Sacramento River would not be compromised by erosion and sedimentation during construction. Short-term impacts on physical/chemical characteristics of the aquatic environment during construction are described further in Section 4.2.1.

4.2.4.2 Biological Characteristics of the Aquatic Environment

Please see the project NES (ICF International 2015a) for information regarding short-term impacts of the project on biological characteristics of the aquatic environment. Avoidance and minimization measures described in the project NES would avoid or minimize the potential for construction-related effects on biological resources in the project area.

4.2.4.3 Human Use Characteristics of the Aquatic Environment

As described in Section 4.2.3, the proposed project would not affect human uses, including designated beneficial uses, of the Sacramento River in the short term during construction of the new bridge.

4.2.5 Long-Term Impacts during Operation and Maintenance

4.2.5.1 Physical/Chemical Characteristics of the Aquatic Environment

Following completion of the proposed project, there is potential for long-term water quality impacts from operation and maintenance activities, such as bridge maintenance, inspections, and repairs. Long-term impacts include alterations in drainage patterns on the bridge, bridge approaches, and roadways and alterations in polluted surface runoff.

The proposed project would adhere to the Statewide Caltrans Stormwater Permit requirements. Compliance with these requirements by implementing post-construction BMPs will ensure that storm water pollution during operation and maintenance of the project would be minimal. Standard facilities used to handle storm water onsite would be an array of structural elements or facilities that would serve to manage, direct, and convey the storm water. Project design measures, such as LID measures, are a means of complying with municipal storm water permits. Implementation of post-construction BMPs would minimize impacts on water quality during long-term operations at the site. Long-term impacts on physical/chemical characteristics of the aquatic environment are described further in Section 4.2.1.

4.2.5.2 Biological Characteristics of the Aquatic Environment

Please see the project NES (ICF International 2015a) for information regarding long-term impacts of the project on biological communities. Avoidance and minimization measures described in the project NES would further avoid or minimize the potential for construction-related effects on aquatic habitat in the project area.

4.2.5.3 Human Use Characteristics of the Aquatic Environment

As described in Section 4.2.3, the proposed project would not affect human use characteristics, including designated beneficial uses, of the Sacramento River in the long term during bridge operation and maintenance.

4.3 Impact Assessment Methodology

Potential impacts resulting from implementing the proposed project were analyzed by comparing existing conditions, as described in the Environmental Setting, to conditions during construction and operation and maintenance of the project. The qualitative analysis assesses the direct and indirect, short- and long-term impacts related to surface hydrology, flood hazards, groundwater recharge, and surface water and groundwater quality as described below.

- **Surface Water Hydrology:** The surface water hydrology impact analysis considered potential changes in the physical characteristics of water bodies, impervious surfaces, and drainage patterns in the project area as a result of project implementation.
- **Flood Hazards:** The impact analysis for flood risk was conducted using FEMA NFIP maps to determine whether the project area overlaps with existing designated 100-year floodplains.
- **Groundwater Recharge:** Impacts on groundwater recharge were assessed by comparing existing sources of recharge versus recharge capabilities following project implementation. Recharge is determined by the ability of water to infiltrate into the soil.
- **Surface Water and Groundwater Quality:** Impacts of the proposed project on surface water and groundwater quality were analyzed using existing information on existing water quality conditions (i.e., 303[d]-listed water bodies), and potential existing sources of water contaminants generated by bridge construction, operation, and maintenance activities. The analysis also considered the potential for water quality objectives to be exceeded, beneficial uses to be compromised, and further degradation of impaired waters as a result of the proposed project.

4.4 Alternative-Specific Impact Analysis

The proposed project under consideration includes one bridge alignment for the new bridge over the Sacramento River and two roadway design alternatives for portions of the roadway design in both Sacramento and West Sacramento. The storm water drainage management plan, structure demolition and roadway modification, and construction storage and staging elements apply to the proposed project and roadway design alternatives together. These elements are considered the most pertinent when analyzing project impacts on hydrology and water quality. Therefore, the proposed project with the roadway design alternatives is considered together as the Build Alternative in this analysis and compared to the No Build Alternative. Where there are differences between the roadway design alternatives, they are identified.

4.4.1 Build Alternatives

The project proposes to construct a new bridge and remove the approach structures at the existing bridge. The analysis in this report addresses potential impacts from the proposed project (new bridge and removal of the existing bridge) with alternatives for roadway design, as described in Section 1.1.3, Project Alternatives. There are two roadway project design alternatives for the Railyards Boulevard/Jibboom Street/Bercut Drive intersection in the City of Sacramento, both of which address different designs for intersections. There are two roadway project design alternatives for residential property access in West Sacramento, both of which address different designs for access to residential properties.

- City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection
  - Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive
  - Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive
- City of West Sacramento Residential Access
  - Alternative 1—C Street Connection to B Street
  - Alternative 2—C Street Connection to 3rd Street

Both roadway design alternatives in the City of Sacramento would result in the same impact on hydrology and water quality resources and therefore are not discussed separately. However, because the City of West Sacramento alternatives have different footprints for residential access, some of the differences in impacts are described separately in the analysis (in Section 4.2 under the “Roadway Modifications” heading) as the (1) proposed project with West Sacramento Residential Access Alternative 1; and the (2) proposed project with West Sacramento Residential Access Alternative 2.

4.4.2 No Build Alternative

Under the No Build Alternative, no bridge would be built and the existing I Street Bridge would continue to be a source of transportation across the Sacramento River between the City of Sacramento and the City of West Sacramento. Because this alternative does not alter existing conditions, there would be no associated impacts on water quality. However, this alternative does not meet the purpose and need of the proposed project.

4.5 Cumulative Impacts

This cumulative analysis examines the effects of the proposed project in combination with other current projects, probable future projects, and projected future growth along the Sacramento River on either the Sacramento or West Sacramento side. The geographic context for the analysis of cumulative impacts associated with surface water hydrology and water quality is the Lower Sacramento Valley Watershed. The context for groundwater hydrology is the Sacramento Valley Groundwater Basin. The context for cumulative hydrology and water quality impacts is geographic and is a function of whether impacts could affect surface water features/watersheds, municipal storm drainage systems of the Cities of Sacramento and West Sacramento, or groundwater in these areas—each of which has its own physical boundary. This analysis accounts for anticipated cumulative growth within the potentially affected geographic area as represented by full implementation of the county and city General Plans. Current and future planned development are identified in the Sacramento Railyards Specific Plan (east of the proposed project) in the City of Sacramento, and in the Washington Specific Plan and Bridge District Specific Plan areas (west of the proposed project) in the City of West Sacramento, as described in Section 2.3, Regional and Local Requirements.

4.5.1 Contribution to Significant Cumulative Water Quality Impacts

Development of the project combined with other past and future development within the potentially affected geographic area could degrade storm water quality through an increase in impervious surface area and increase in contaminated runoff, which ultimately could violate water quality standards, affect beneficial uses, and/or further impair 303(d)-listed waters within the Lower Sacramento Valley Watershed and the Sacramento Valley Groundwater Basin. Water quality of storm water runoff varies with surrounding land uses, topography, and amount of impervious cover—as well as with the intensity (energy) and frequency of irrigation or rainfall. During construction, runoff may contain sediments and other construction materials and wastes (e.g., concrete debris) resulting from activities such as site clearing and grubbing, demolition and removal of existing structures and pavement, cut-and-fill activities, grading and excavation,

paving, building construction, tree removal, and landscaping. During operation, runoff may contain oil, grease, and metals accumulated in the streets and driveways, in addition to pesticides, herbicides, particulate matter, nutrients, animal waste, and other oxygen-demanding substances from landscaped areas. The highest pollutant concentrations are generally in storm water runoff generated at the beginning of the wet season and during the first flush, where approximately 80% of total accumulated pollutants are washed off surfaces with the first 0.5 inch of rainfall, with street surfaces as the primary source of pollutants in urban areas.

Planned development could affect water quality if the land use changes, the intensity of land use changes, and/or drainage conditions are altered to facilitate the introduction of pollutants to surface water or groundwater resources. Changes in land use would alter the associated type and amount of pollutants in storm water runoff (e.g., higher fecal coliform concentrations in runoff from residential lands compared to commercial lands). Increased intensity of land use would increase the potential pollutant loads. Alterations in drainage patterns could increase pollutant loads by increasing the amount of storm water runoff transporting pollutants, could cause or contribute to erosion if the rate of runoff is increased, and could expose vulnerable areas to infiltration or runoff.

Construction of the proposed project as well as construction of other planned projects in the vicinity would result in surface disturbance through grading, trenching, and compaction associated with typical development activities. Existing vegetation would be removed, thereby increasing the potential for erosion. Consistent with municipal storm water programs for Sacramento, West Sacramento, and Caltrans, project-specific SWPPPs would include implementation of construction BMPs. In addition, other necessary site-specific permits (i.e., Water Quality Certification, Low-Threat Dewatering Permit, Streambed Alteration Agreement, Section 404 Permit) would be obtained for this and other planned projects; and associated measures would be implemented to sufficiently reduce potential surface water quality impacts during construction, preventing cumulative impacts. Therefore, the proposed project would not contribute to a cumulative water quality impact during construction.

During project operation, the proposed project could contribute to degradation of water quality and a cumulative impact if the project altered land use such that the type and concentration of pollutants in storm water runoff increased. Some of the areas within the project vicinity (i.e., Sacramento Railyards, portions of West Sacramento) are currently unpaved, and new development projects would increase impervious surface area that would result in increased storm water runoff. Projects would be consistent with municipal storm water programs for Sacramento, West Sacramento, and Caltrans, and therefore would include post-construction design measures, such as LID and vegetative areas to allow for infiltration and water quality

treatment. The proposed project does not represent a significant departure from the existing land use of the area nor a substantial increase in the impervious surface area. Storm water runoff would be directed to existing storm water collection systems. Therefore, the proposed project would not contribute to a cumulative water quality impact during operation.

Based on the above, cumulative impacts on surface water quality, and the project's contribution to cumulative impacts on surface water quality, would not be cumulatively considerable.

4.5.2 Contribution to Significant Groundwater or Storm Water Drainage Capacity Impacts

4.5.2.1 Groundwater

Groundwater recharge in the Sacramento Valley Groundwater Basin occurs primarily through streamflow infiltration and direct recharge from soil infiltration in pervious areas. Most future projects in the groundwater basin would be redevelopment or infill projects in highly urbanized areas where recharge does not occur. Development in highly urbanized areas would not be expected to substantially increase the amount of impervious surfaces. Because this development would occur primarily in already urbanized areas with existing impervious surfaces, groundwater recharge from percolating rainfall potential would not be adversely affected, and indirect lowering of the local groundwater table is not likely to occur. However, development in areas without existing impervious surfaces would affect groundwater recharge and may result in cumulatively considerable impacts on groundwater.

Excavations requiring dewatering and subsurface features of new buildings in the project area served by the CSS to the Sacramento River, and the separated storm water system, are expected to require some level of dewatering during construction and/or operation because of shallow groundwater conditions. It is possible that dewatering would occur concurrently for various construction projects in the area. This could cause localized shifts in groundwater patterns that could cause areas of degraded groundwater quality to migrate. However, the dewatering protocol established by the cities and enforced at the city level would apply to the proposed project and other development where dewatering is needed within the cities. City staff would review all permit applications for dewatering. This would enable the Cities to determine the volumes and frequencies of discharges that would be allowed to the CSS or separated storm water system from each project to ensure that capacity is not exceeded, water quality violations do not occur, and local groundwater levels do not shift substantially.

Therefore, cumulative impacts on groundwater supply and quality, and the project's contribution to cumulative impacts on groundwater supply and quality would not be cumulatively considerable.

4.5.2.2 Storm Drainage Capacity

Planned development could increase the rate and volume of storm water runoff due to the overall increase in impervious surfaces. Increases in the rate or volume of storm water runoff can cause localized flooding if the storm drain capacity is exceeded, or if flows exceed channel capacities and are conveyed to overbank areas where flood storage may not be available. Proposed projects within the Cities of Sacramento and West Sacramento are required to comply with the stormwater drainage requirements in order to maintain adequate drainage system capacity to convey 100-year peak flows. For the most part, projects with potential cumulative impacts would occur in areas that are already highly developed with impervious surfaces. Therefore, changes in flows that could increase localized flood risk would not be expected to be substantial. The project area is subject to flooding during 50-year, 100-year, and 200-year flood events. New development, including the proposed project, could increase impervious areas and result in greater flood flows, place impediments to flow that would raise flood levels, and/or place additional people or structures within flood-prone areas. Existing regulations and requirements, such as DWR's FloodSafe California Urban Levee Design Criteria and Caltrans' Hydraulic Design Criteria, require site-specific actions to avoid increasing flood levels and placing people or structures at risk of flood flows up to the current 100-year event condition. No current regulatory requirements fully address long-term flood risks due to accelerated sea level rise. Thus, it cannot be guaranteed that project and cumulative development requirements would address all contingencies, and the potential exists for significant flooding impacts both now and in the future. Project design would accommodate 50-year, 100-year and 200-year flood events.

All projects with potential cumulative impacts on storm drainage capacity would be required to include design features that would reduce flows to pre-project conditions, according to Caltrans MS4 Permit requirements, and other municipal storm water requirements. The proposed project would be required to design a storm water drainage system in compliance with these requirements. Thus, cumulative impacts on storm drainage capacity would likely be less than significant, and the project's contribution to impacts on storm drainage capacity would not be cumulatively considerable.

Chapter 5 Avoidance and Minimization Measures

5.1 Introduction

Implementation of water quality measures (management measures and BMPs) are required to address project-related water quality impacts during construction, operation, and maintenance of the bridge. Key management measures include the following:

- Protect areas that provide important water quality benefits or are particularly susceptible to erosion or sediment loss.
- Minimize the potential for erosion via limiting land disturbances such as clearing and grading and cut/fill.
- Preserve any existing terrain providing desirable drainage courses or effective filtration.
- Limit disturbance of natural drainage features and vegetation.
- Prepare and implement an approved SWPPP.
- Ensure proper storage and disposal of potential hazardous material.
- Incorporate pollution prevention into operation and maintenance procedures to reduce pollutant loadings to surface runoff.

5.2 Proposed Hydrology and Water Quality Measures

The following measures will be implemented to avoid or minimize potential hydrology and water quality impacts of the proposed project.

5.3 Water Quality Protection Measures

5.3.1 Construction

Construction of the I Street Bridge would involve pile driving; removal of the existing bridge; cofferdam installation and removal; pier installation; and placement of barge spuds; construction of the concrete bridge deck and railing; creation and use of construction staging area(s); operation of heavy construction equipment (e.g., graders, excavators) alongside Sacramento River; road widening and raising; new drainage facilities; embankment construction;

constructing the end bridge abutments; and other related activities. Impacts from these activities would be avoided or minimized because all construction activities within the Sacramento River would comply with a variety of permits and requirements from agencies, including the State Water Board/Central Valley Water Board, USACE, CDFW, as well as the Sacramento County, Yolo County, City of Sacramento, and City of West Sacramento Public Works Departments.

Since the project is greater than one acre, it is required to be covered under the Construction General Permit issued by the State Water Board. The proposed project will implement construction BMPs based on guidance from several resources including the Caltrans Construction Site Best Management Practices Manual (California Department of Transportation 2003), and any other related local stormwater guidance documents.

The project proponent, and/or the construction contractor, will comply with all construction site BMPs specified in the SWPPP and any other permit conditions to minimize introduction of construction-related contaminants and mobilization of sediment in the Sacramento River. Broadly, these BMPs will address soil stabilization, sediment control, wind erosion control, vehicle tracking control, non-storm water management, and waste management practices. The BMPs will be based on the best conventional and best available technology.

The BMPs will be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable and are subject to review and approval by the County. As part of Construction General Permit compliance, the project SWPPP will require the construction contractor to implement, monitor, and maintain appropriate BMPs. Routine inspections will be performed of the construction area to verify the BMPs are properly implemented and maintained. The contractors will be notified immediately if there is a noncompliance issue and will require compliance.

The BMPs will include, but are not limited to, those presented below. The categories provided are based on Construction Site BMP Fact Sheets provided by Caltrans (http://www.dot.ca.gov/hq/construc/stormwater/factsheets.htm) and the Construction BMPs provided in the California Stormwater Quality Association's BMP Handbook (California Stormwater Quality Association 2015).

Scheduling

The project is estimated to be constructed in 30 months starting in 2018. All in-water work within Sacramento River will be conducted during allowable work windows as identified by resource and permitting agencies.

Vehicle & Equipment Fueling and Maintenance

Equipment used in and around drainages and wetlands will be in good working order and free of dripping or leaking engine fluids. All vehicle maintenance will be performed at least 300 feet from the Sacramento River and all drainages and wetlands. Any necessary equipment washing will be carried out where the water cannot flow into the river or other drainages, or wetlands.

Spill Prevention

Potential release or spillage of petroleum products such as diesel fuel, hydraulic fluid, and lubrication greases, from a vehicle or piece of equipment during maintenance or fueling could affect water quality if these petroleum products infiltrate into soil or are washed into nearby storm drains or directly into the Sacramento River. However, given that the volume of petroleum released during an incidental spill on a construction site is typically small (less than 25 gallons) and can be cleaned up immediately, impacts associated with petroleum spills during the construction phase are considered minor. The project proponent will comply with applicable stormwater ordinances, stormwater management plans, the project Spill Prevention, Control, & Countermeasure (SPCC) plan, and BMPs to prevent or minimize the potential release of contaminants into surface waters and groundwater. Implementation of standard construction procedures and precautions for working with petroleum and construction chemicals will further ensure that the impacts related to chemical handling during project construction will be minor. The project will include development and implementation of a hazardous material SPCC plan before construction begins. The plan will include strict onsite handling rules to keep construction and maintenance materials from entering the river, including procedures related to refueling, operating, storing and staging construction equipment and preventing and responding to spills. The plan will also identify the parties responsible for monitoring the spill response. During construction, any spills will be cleaned up immediately according to the spill prevention and countermeasure plan. The County will review and approve the contractors' potential hazardous material SPCC plan before allowing construction to begin.

Hazardous and Concrete Waste Management

The following types of materials will be prohibited from being rinsed or washed into the streets, shoulder areas, or gutters: concrete; solvents and adhesives; thinners; paints; fuels; sawdust; dirt; gasoline; asphalt and concrete saw slurry; heavily chlorinated water.

Material Delivery and Storage

Proper storage and disposal of potential hazardous material will be ensured. Any surplus concrete rubble, asphalt, or other rubble from construction will be taken to a local landfill.

Erosion and Sediment Control

An erosion and sediment control plan will be prepared and implemented for the proposed project. The potential for erosion and sedimentation will be managed using effective construction and engineering BMPs. These practices include stabilizing the soil surface, reducing erosive energy of surface flow, filtering runoff, and capturing sediment-laden water. The project proponents will require their construction contractors to implement BMPs included in the SWPPP and comply with grading ordinances that protect the river from erosion and sedimentation. The following is a list of potential erosion and sediment control measures that would likely be implemented to reduce potential project water quality impacts and comply with the Construction General Permit:

- Silt Fence: Temporary erosion control measures, such as sandbagged silt fences, will be applied throughout construction of the proposed project and will be removed after the working area is stabilized or as directed by the engineer. Soil exposure will be minimized through use of temporary BMPs, groundcover, and stabilization measures.
- Wind Erosion Control: Exposed dust-producing surfaces will be sprinkled daily, if necessary, until wet; this measure will be controlled to avoid producing runoff. Paved roads will be swept daily following construction activities.
- Hydroseeding: An appropriate seed mix of native species will be planted on disturbed areas upon completion of construction.
- Soil Binders: Cover or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more) that could contribute sediment to waterways.
- Stockpile management: Enclose and cover exposed stockpiles of dirt or other loose, granular construction materials that could contribute sediment to waterways. Material stockpiles will be located in non-traffic areas only. Side slopes will not be steeper than 2:1. All stockpile areas will be surrounded by a filter fabric fence and interceptor dike
- Avoid earth or organic material from being deposited or placed where it may be directly carried into the channel.

Dewatering Operations

Before discharging any dewatered effluent to surface waters, the applicant or its contractors will obtain a Low Threat Discharge and Dewatering NPDES permit from the Central Valley Regional Water Quality Control Board. As part of the permit, the project proponent will design and implement measures as necessary so that the discharge limits identified in the relevant permit are met. Should dewatering be discharged into the Sacramento River or nearby storm drains, the

Low Threat Discharge and Dewatering NPDES permit would require proper disposal of the water. As a performance standard, these measures will be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. Implemented measures may include the retention of dewatering effluent until particulate matter has settled before it is discharged, use of infiltration areas, and other BMPs. For example, dewatered turbid water could be diverted to a settling tank, and/or treated in a manner to ensure compliance with water quality requirements prior to being discharged to infiltration basins or re-used for dust control or landscape irrigation. Final selection of water quality control measures will be subject to approval by the Central Valley Regional Water Quality Control Board.

In addition, Caltrans has a Field Guide to Construction Site Dewatering that provides the Resident Engineer with step-by-step instructions for overseeing dewatering operations on the construction site. All aspects of dewatering are addressed, from the selection of an appropriate dewatering management option to ensuring compliance with requirements specified in the Caltrans NPDES permit, Sacramento County MS4 Permit, and the State Water Board's Small MS4 Permit for operations, maintenance, and reporting. Detailed information about sediment removal methods and technologies are provided in Appendix B of the Field Guide.

Water Quality Monitoring

Baseline turbidity, pH, specific conductance, and temperatures in Sacramento River will be measured. As required by the Regional Water Board, exceedances of water quality standards specified in the Basin Plan for the Sacramento and San Joaquin River Basins will be avoided.

Implementation of the SWPPP, Caltrans BMPs, and the cities of Sacramento and West Sacramento stormwater guidance measures will minimize the potential for construction-related surface water pollution and ensure that water quality in the Sacramento River will not be compromised by erosion and sedimentation during construction. A 401 Water Quality Certification will be obtained from the Central Valley Water Board, which may contain additional BMPs and water quality measures to ensure the protection of water quality.

5.3.2 Operation

The new bridge and road design will incorporate permanent erosion control elements, primarily permanent vegetation, to ensure that stormwater runoff does not cause soil erosion. Implementation of the project-specific long-term avoidance and minimization measures and design BMPs will also reduce or avoid impacts on water quality.

The proposed project will adhere to the requirements of the Caltrans NPDES Permit, Sacramento County MS4 Permit, and the State Water Board's Small MS4 Permit and ensure that stormwater

pollution during operation and maintenance of the project will be minimal by implementing design measures recommended in Caltrans guidance documents, and post-construction BMPs. Standard facilities used to handle stormwater onsite will include an array of structural elements or facilities that will serve to manage, direct, and convey the stormwater.

Project design measures, such as LID facilities, are a means of complying with municipal stormwater permits. The proposed project design includes the installation of vegetated slopes and swales along bridge approaches where water will be treated through soil infiltration and vegetative uptake. All such stormwater drainage facilities will be designed per the Caltrans and BMP guidelines to sufficiently accommodate large storm flows. The implementation of BMPs will minimize impacts to water quality during long-term operations at the site. The BMPs include measures to ensure the post-construction controls (e.g., source controls and site design) are in place to minimize water quality impacts. Regulatory compliance measures, as discussed above, will minimize the potential for surface water degradation over the long term. The project proponent will also obtain a 401 Water Quality Certification from the Central Valley Water Board that may include additional BMPs.

5.3.3 Groundwater Protection Measures

The proposed project will not substantially affect groundwater resources because, if excavations are required, they would only intersect the shallow water table temporarily with only localized and inconsequential effects to the regional groundwater system. While small amounts of construction-related dewatering are covered under the General Construction Permit, the proposed project may also need to comply with the Central Valley Regional Water Quality Control Board's Low Threat General Dewatering Permit. In addition, Caltrans has a Field Guide to Construction Site Dewatering that provides the Resident Engineer with step-by-step instructions for overseeing dewatering operations on the construction site. All aspects of dewatering are addressed, from the selection of an appropriate dewatering management option to ensuring compliance with Caltrans NPDES permit requirements for operations, maintenance, and reporting.

5.3.4 Drainage Control Measures

The new bridge and roadway approaches would involve minor additional impervious surface area compared to the existing structures once construction is completed. Potential new surface flows from the project would be designed so as to mimic pre-project flows. Drainage system improvements would be designed to accommodate storm drain infrastructure capacities and prevent ponding. The proposed project will be designed in accordance with the objectives of Caltrans NPDES Permit requirements, and related stormwater requirements to reduce runoff and

the volume of entrained sediment. In addition, the potential minimal increase in impervious area would not cause on- or off-site flooding.

Chapter 6 References

California Department of Fish and Game. 2008. *California Aquatic Invasive Species Management Plan*. January 2008. Available: <http://www.dfg.ca.gov/invasives/plan/>. Accessed: February 11, 2014.

California Department of Transportation (Caltrans). 2003. Storm Water Quality Handbooks. Project Planning and Design Guide. Storm Water Pollutant Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual. Construction Site Best Management Practices (BMPs) Manual. March. Available: http://www.dot.ca.gov/hq/construc/stormwater/CSBMPM_303_Final.pdf. Accessed: July 30, 2013.

California Department of Transportation. 2007. Fish Passage Design for Road Crossings: An Engineering Document Providing Fish Passage Design Guidance for Caltrans Projects. May 2007.

California Department of Transportation. 2015. Officially Designated State Scenic Highways. Available: <http://www.dot.ca.gov/hq/LandArch/scenic/schwy.htm>. Last updated: October 14, 2013. Accessed: June 22, 2015.

California Department of Water Resources. 2004. Bulletin 118: South American Subbasin. Available: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/5-21.65.pdf. Accessed: April 10, 2015.

California Department of Water Resources (DWR). 1995. Sacramento-San Joaquin Delta Atlas.

California Department of Water Resources. 2010. Fact Sheet: Sacramento River Flood Control Project Weirds and Flood Relief Structures. Available: http://www.water.ca.gov/newsroom/docs/WeirsReliefStructures.pdf. Accessed: April 10, 2015.

California Stormwater Quality Association. 2015. Construction BMP Online Handbook. January. Available (by subscription): https://www.casqa.org/resources/bmp-handbooks/construction.

Central Valley Regional Water Quality Control Board. 2011. Fourth Edition of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins. Available:

http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr.pdf. Accessed: April 10, 2015.

Ceres. 2014. Sacramento Valley Bioregion – An Overview. Available: http://ceres.ca.gov/geo_area/bioregions/Sacramento_Valley/about.html. Accessed: April 10, 2015.

City of Sacramento. 2015. *Sacramento 2035 General Plan*. Adopted March 3, 2015. Sacramento, CA.

City of Sacramento. 2015a. *Sacramento 2035 General Plan*. Adopted March 3, 2015. Sacramento, CA.

City of Sacramento. 2007. Sacramento Railyards Specific Plan. Sacramento, California.

City of Sacramento. 2009. Stormwater Quality Improvement Plan for the County of Sacramento, Citrus Heights, Elk Grove, Folsom, Galt, and Rancho Cordova. November. Available: http://www.beriverfriendly.net/documents/. Accessed: 8/4/15.

City of Sacramento. 2011. River District Specific Plan. Community Development Department and Economic Development Department. Sacramento, California.

City of West Sacramento. 1996. Washington Specific Plan. West Sacramento, California.

City of West Sacramento. 2000. General Plan. Updated 2008. West Sacramento, California.

City of West Sacramento. 2003. City of West Sacramento Stormwater Management Program (SWMP) Planning Document. Prepared by Larry Walker Associates. March.

City of West Sacramento. 2008. *City of West Sacramento General Plan, Policy Document*. Adopted: March 2000. Last updated: October 2008. West Sacramento, CA.

City of West Sacramento. 2010. Water Quality: 2010 Consumer Confidence Report. Available: https://www.cityofwestsacramento.org/city/depts/pw/public_works_operations/environmental_prog/waterquality.asp. Accessed: April 10, 2015.

California Department of Water Resources. 2004. Bulletin 118: South American Subbasin. Available: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/5-21.65.pdf. Accessed: April 10, 2015.

Federal Emergency Management Agency. 2012. Flood Insurance Rate Map. Sacramento County, California. Panel 180 of 705.

GEI Consultants, Inc. 2014. Preliminary Geotechnical and Foundation Report. I Street Bridge Replacement. Sacramento, California. Submitted to Mark Thomas and Company. Contract Number SA-14108. August.

ICF International. 2015a. Natural Environment Study for the I Street Bridge Replacement Project. Draft Report. July.

ICF International. 2015b. Visual Impact Assessment for the I Street Bridge Replacement Project. Draft Report. July.

MBK Engineers. 2015. Technical Memorandum: Preliminary Hydraulic Analysis for I Street Bridge Replacement Project

Moyle et al. 1995. Fish Species of Special Concern in California. Second Edition. Prepared for California Department of Fish and Game, Rancho Cordova. Contract No. 2128IF.

Natural Resources Conservation Service. 2015. Web Soil Survey. U.S. Department of Agriculture (USDA). Available: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed: April 10, 2015.

Sacramento River Watershed Program. 2010. Sacramento Valley Subregion. Available: http://www.sacriver.org/aboutwatershed/roadmap/watersheds/sacramento-valley-subregion. Accessed: April 10, 2015.

Sacramento River Watershed Program. 2015. Sacramento River Basin. Available: http://www.sacriver.org/aboutwatershed/. Accessed: April 10, 2015.

State Water Resources Control Board. 2011. 2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report) — Statewide. Available: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml. Accessed: April 10, 2015.

State Water Resources Control Board. 2015. State Water Quality Protection Areas of Special Biological Significance. Available: http://www.swrcb.ca.gov/water_issues/programs/ocean/asbs.shtml. Accessed: April 10, 2015.

Sacramento Stormwater Quality Partnership. 2009. Stormwater Quality Improvement Plan. Prepared for the County of Sacramento and the Cities of Sacramento, Citrus Heights, Elk Grove, Folsom, Galt, and Rancho Cordova. Submitted to the Central Valley Water Board. April. Available: http://waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/sacramento/r5-2010-0017_2009sqip.pdf. Accessed: November 19, 2015.

Sacramento Stormwater Quality Partnership. 2013. Sacramento Stormwater Quality Partnership Hydromodification Management Plan. Prepared by Brown and Caldwell and CBEC eco-engineering for the County of Sacramento and the Cities of Sacramento, Citrus Heights, Elk Grove, Folsom, Galt, and Rancho Cordova. Original version July 29, 2011. Revised February 14, 2013. Available: http://www.beriverfriendly.net/docs/files/File/HMP/HMP_Feb2013.pdf. Accessed: November 19, 2015.

U.S. Army Corps of Engineers. 2015. Sacramento River Bank Protection Project. Available: http://www.spk.usace.army.mil/Missions/CivilWorks/SacramentoRiverBankProtection.aspx. Accessed: April 10, 2015.

U.S. Department of Agriculture. 2015. Natural Resource Conservation Service. Web Soil Survey. Available: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed July 8, 2015.

U.S. Department of Fish and Wildlife. 2014. Sacramento Fish and Wildlife Office: Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and or USGS 7 ½ Minute Quads Requested. Document Number 14122202293.

U.S. Geological Survey. 2015. National Watershed Boundary Dataset. Available: http://nhd.usgs.gov/wbd.html. Accessed July 8, 2015

U.S. Census Bureau. 2010. *2010 Demographic Profile Data*. Available: <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t#none>. Accessed: June 2015.

Western Regional Climate Center. 2015a. Sacramento Executive Airport: Monthly Total Precipitation (inches). Available: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7633. Accessed: April 10, 2015.

Western Regional Climate Center. 2015b. Sacramento Executive Airport: Normals, Means, and Extremes Temperatures. Available: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7633. Accessed: April 10, 2015.

Chapter 7 Preparer(s) Qualifications

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Attachment A Construction General Permit SWPPP Risk Level Assessment

- Summary of Risk Level Determination
- Risk Determination Worksheet (State Water Resources Control Board)
- Isoerodent Map of California (State Water Resources Control Board)
- Web Soil Survey (USDA Natural Resources Conservation Service)

A. CONSTRUCTION GENERAL PERMIT SWPPP RISK LEVEL ASSESSMENT

The General NPDES Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order 2009-0009-DWQ) (Construction General Permit) regulates stormwater discharges for construction activities CWA Section 402. Dischargers whose projects disturb 1 or more acres of soil, or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain coverage under the Construction General Permit. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and pre- and post-construction aquatic biological assessments during specified seasonal windows.

A.1 Summary

The I Street Bridge Replacement Project(proposed project) involves greater than one acre of land disturbance, and therefore a Stormwater Pollution Prevention Plan (SWPPP) is required for the proposed project. More information on SWPPP requirements is provided in Section 2.1, *Section 402—National Pollutant Discharge Elimination System*. A construction site risk assessment has been performed for the Project SWPPP and the resultant risk level is **Risk Level 2**. The risk level was determined based on the procedure described in the General Permit and based two major elements – (1) project sediment risk (the relative amount of sediment that can be discharged, given the project and location details) and (2) receiving water risk (the risk sediment discharges pose to the receiving waters). Project Sediment Risk is determined by multiplying the R, K, and LS factors from the Revised Universal Soil Loss Equation (RUSLE) to obtain an estimate of project-related bare ground soil loss expressed in tons/acre. Receiving water risk is based on whether a project drains to a sediment-sensitive water body. A sediment-sensitive water body is either on the most recent 303d list for water bodies impaired for sediment; has a USEPA-approved Total Maximum Daily Load implementation plan for sediment; or has the beneficial uses of COLD, SPAWN, and MIGRATORY.

Tables A.1 and A.2 summarize the sediment and receiving water risk factors and document the sources of information used to derive the factors. RUSLE Method 2 was used to determine these values.

Table A.1. Summary of Sediment Risk

RUSLE Factor	Value	Method for Establishing Value
R	105	EPA website: http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm.
K	0.14	Weighted average for surface layer of soil map units
LS	0.20	Field observations and LS Table from Sediment Risk Factor Worksheet in General Permit. Calculation assumes 1% slope (based on NRCS data) and 300 foot slope length.
Total Predicted Sediment Loss (tons/acre)		2.94
Overall Sediment Risk Low Sediment Risk < 15 tons/ acre Medium Sediment Risk >= 15 and < 75 tons/acre High Sediment Risk >= 75 tons/acre		☒ Low ☐ Medium ☐ High

Table A.2. Summary of Receiving Water Risk

Receiving Water Name	303(d) Listed for Sediment Related Pollutant(1)	TMDL for Sediment Related Pollutant(1)	Beneficial Uses of COLD, SPAWN, and MIGRATORY(1)
Sacramento-San Joaquin Delta	☐ Yes ☒ No	☐ Yes ☒ No	☒ Yes ☐ No
Middle River	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No
Overall Receiving Water Risk			☐ Low ☒ High

(1) If yes is selected for any option the Receiving Water Risk is High

A.2 Project Sediment Risk

A.2.1 The R-Factor

The R factor is computed by using the following parameters:

Estimated construction start date: May 1, 2018

Estimated construction end date (date of final stabilization): May 1, 2021

Erosivity Index (EI) distribution zone (Figure 1 of the Construction General Permit Risk Assessment R-Factor Calculation Notification): 23

EI Value (Table 1, the Erosivity Index (EI) Table of the Construction General Permit Risk Assessment R-Factor Calculation Notification): 100% X 3 years = 300% (if project lasts for one year, EI value is 100%)

Isoerodent Value for Project Area (Isoerodent Map for California in the Construction General Permit Risk Assessment R-Factor Calculation Notification): 35

R Factor = (300%)*(35) = 105

A.2.2 The K-Factor

The K factor is computed by using the following parameters:

K-values were provided per soil unit type via a Natural Resources Conservation District (NRCS) Web Soil Survey. A weighted average was derived from the K-values based on the proportionate areas per soil unit type within the total area of influence (AOI) (291.1 acres). The weighted average was determined to be 0.12, which is characterized as a low K value within the range (about 0.05 to 0.15) of fine-textured soils that are high in clay and the particles are resistant to detachment. Table A.3 shows a summary of all the map units with the project area of influence from which the K-value was calculated.

Table A.3. Determination of K-Value for Project Area of Influence

Map Unit Symbol[1]	Name[1]	K-Value[1]	Weighted K-Values	Acres in AOI[1]
Sacramento County, California (CA067)				
186	Orthents-Urban land complex, 0 to 2 percent slopes	--	0	23
227	Urban Land	--	0	3.8
Yolo County, California (CA113)				
La	Lang sandy loam	0.24	1.848	7.7
Lb	Lang sandy loam, deep	0.24	2.712	11.3
So	Sycamore silt loam	0.43	2.795	6.5
TOTAL			7.4	52.3
Weighted Average			0.14	

[1] Source: Natural Resources Conservation District (NRCS). 2013. Web Soil Survey. Available: http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm. Accessed: March 27, 2013.

Key:
"—" = not specified
AOI = Area of Influence

A.2.3 The LS-Factor

The LS Factor was determined based on the following factors:

Based on the NRCS soil unit map (see attached), slopes within the Project area are 0-2%. Therefore a 1% slope was assumed. Because a topographical map was not available to determine the length of slope, because there is very little microtopography (generally flat terrain with little variation), a 300-foot slope length was used. The average slope percentage and slope length was used with the LS Factors for Construction Sites Table to determine the LS Factor of 0.20.

A.3 Receiving Water Risk

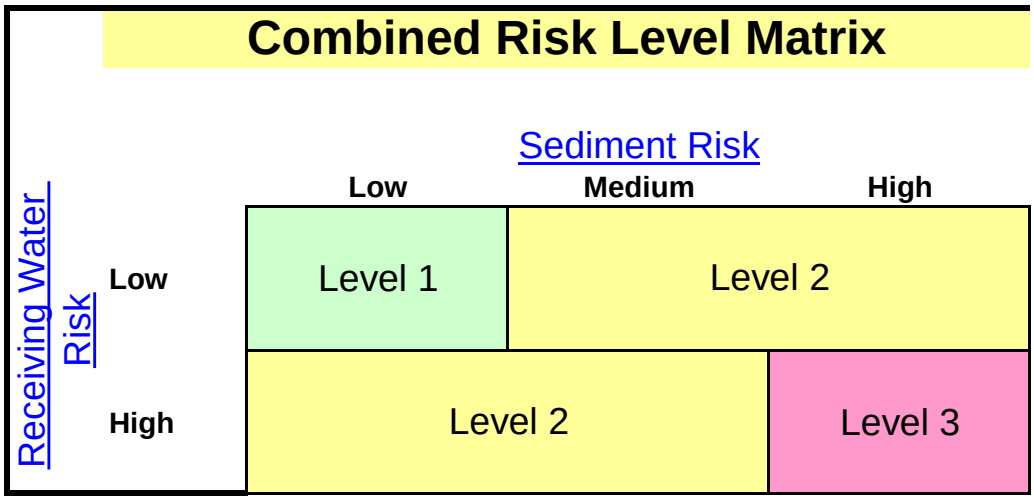
The Receiving water risk was determined to be "High" based on the fact that the Sacramento River has the designated existing beneficial uses of COLD, SPAWN, and MIGRATORY, which is included in the criteria for receiving water risk determination.

	A	B	C	D	E	F	G
1	Version 8/17/2011						
2		**Risk Determination Worksheet**					
3							
4		**Step 1**	Determine Sediment Risk via one of the options listed:				
5			1. GIS Map Method - EPA Rainfall Erosivity Calculator & GIS map				
6			2. Individual Method - EPA Rainfall Erosivity Calculator & Individual Data				
7		**Step 2**	Determine Receiving Water Risk via one of the options listed:				
8			1. GIS map of Sediment Sensitive Watersheds provided				
9			2. Site Specific Analysis (support documentation required)				
10		**Step 3**	Determine Combined Risk Level				
11							

	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://water.epa.gov/polwaste/npdes/stormwater/Welcome-to-the-Rainfall-Erosivity-Factor-Calculator.cfm		
5	**R Factor Value**		105
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9	**K Factor Value**		0.14
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13	**LS Factor Value**		0.20
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**		2.94
16	**Site Sediment Risk Factor**		**Low**
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	**yes/no**	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment** (For help with impaired waterbodies please visit the link below) or has a **USEPA approved TMDL implementation plan for sediment**?:	**yes**	**High**
http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml		
OR		
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan)		
http://www.waterboards.ca.gov/waterboards_map.shtml		
Region 1 Basin Plan		
Region 2 Basin Plan		
Region 3 Basin Plan		
Region 4 Basin Plan		
Region 5 Basin Plan		
Region 6 Basin Plan		
Region 7 Basin Plan		
Region 8 Basin Plan		
Region 9 Basin Plan		

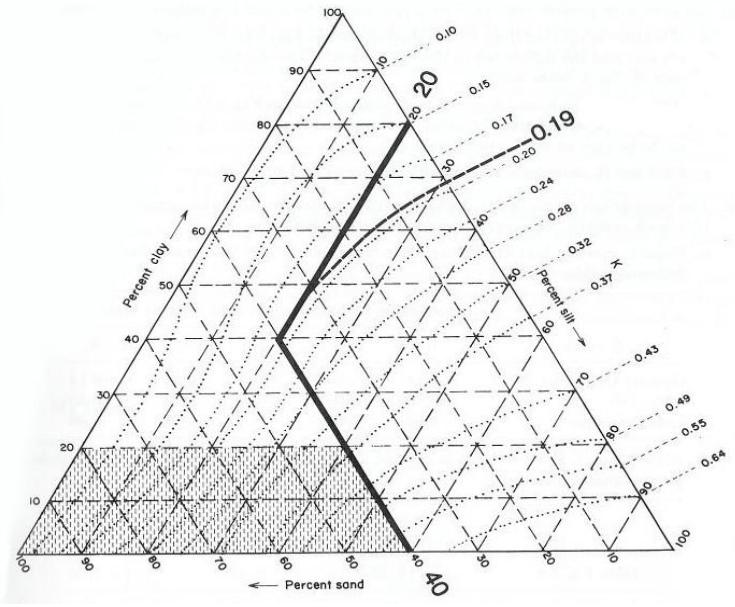
Combined Risk Level Matrix



Project Sediment Risk:	**Low**
Project RW Risk:	**High**
Project Combined Risk:	**Level 2**

Soil Erodibility Factor (K)

The K factor can be determined by using the nomograph method, which requires that a particle size analysis (ASTM D-422) be done to determine the percentages of sand, very fine sand, silt and clay. Use the figure below to determine appropriate K value.



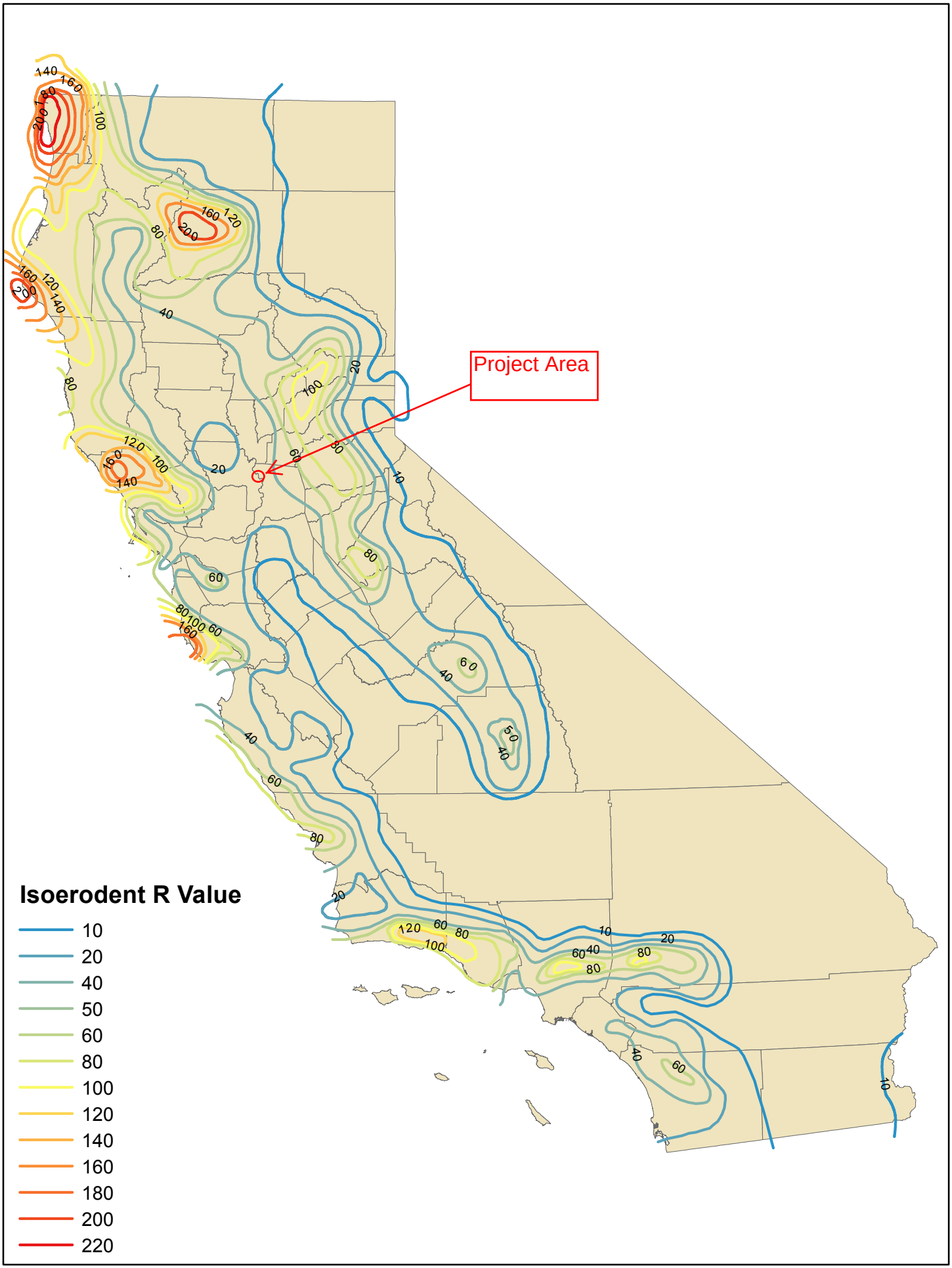
Erickson triangular nomograph used to estimate soil erodibility (K) factor.
The figure above is the USDA nomograph used to determine the K factor for a soil, based on its texture (% silt plus very fine sand, % sand, % organic matter, soil structure, and permeability). *Nomograph from Erickson 1977 as referenced in Goldman et. al., 1986.*

Sheet Flow Length (ft)	Average Watershed Slope (%)																		
	0.2	**0.5**	**1.0**	**2.0**	**3.0**	**4.0**	**5.0**	**6.0**	**8.0**	**10.0**	**12.0**	**14.0**	**16.0**	**20.0**	**25.0**	**30.0**	**40.0**	**50.0**	**60.0**
<3	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.35	0.36	0.38	0.39	0.41	0.45	0.48	0.53	0.58	0.63
6	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.37	0.41	0.45	0.49	0.56	0.64	0.72	0.85	0.97	1.07
9	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.38	0.45	0.51	0.56	0.67	0.80	0.91	1.13	1.31	1.47
12	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.39	0.47	0.55	0.62	0.76	0.93	1.08	1.37	1.62	1.84
15	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.40	0.49	0.58	0.67	0.84	1.04	1.24	1.59	1.91	2.19
25	0.05	0.07	0.10	0.16	0.21	0.26	0.31	0.36	0.45	0.57	0.71	0.85	0.98	1.24	1.56	1.86	2.41	2.91	3.36
50	0.05	0.08	0.13	0.21	0.30	0.38	0.46	0.54	0.70	0.91	1.15	1.40	1.64	2.10	2.67	3.22	4.24	5.16	5.97
75	0.05	0.08	0.14	0.25	0.36	0.47	0.58	0.69	0.91	1.20	1.54	1.87	2.21	2.86	3.67	4.44	5.89	7.20	8.37
100	0.05	0.09	0.15	0.28	0.41	0.55	0.68	0.82	1.10	1.46	1.88	2.31	2.73	3.57	4.59	5.58	7.44	9.13	10.63
150	0.05	0.09	0.17	0.33	0.50	0.68	0.86	1.05	1.43	1.92	2.51	3.09	3.68	4.85	6.30	7.70	10.35	12.75	14.89
200	0.06	0.10	0.18	0.37	0.57	0.79	1.02	1.25	1.72	2.34	3.07	3.81	4.56	6.04	7.88	9.67	13.07	16.16	18.92
250	0.06	0.10	0.19	0.40	0.64	0.89	1.16	1.43	1.99	2.72	3.60	4.48	5.37	7.16	9.38	11.55	15.67	19.42	22.78
300	0.06	0.10	0.20	0.43	0.69	0.98	1.28	1.60	2.24	3.09	4.09	5.11	6.15	8.23	10.81	13.35	18.17	22.57	26.51
400	0.06	0.11	0.22	0.48	0.80	1.14	1.51	1.90	2.70	3.75	5.01	6.30	7.60	10.24	13.53	16.77	22.95	28.60	33.67
600	0.06	0.12	0.24	0.56	0.96	1.42	1.91	2.43	3.52	4.95	6.67	8.45	10.26	13.94	18.57	23.14	31.89	39.95	47.18
800	0.06	0.12	0.26	0.63	1.10	1.65	2.25	2.89	4.24	6.03	8.17	10.40	12.69	17.35	23.24	29.07	40.29	50.63	59.93
1000	0.06	0.13	0.27	0.69	1.23	1.86	2.55	3.30	4.91	7.02	9.57	12.23	14.96	20.57	27.66	34.71	48.29	60.84	72.15

LS Factors for Construction Sites. *Table from Renard et. al., 1997.*

0.42 mile = 2,217 feet

Map Unit Symbol	Name	K-value	Weighted K-values	Acres in AOI	Percent of AOI
186	Orthents-Urban land complex, 0 to 2		0	23	31%
227	Urban Land		0	3.8	5%
247	Water		0		17%
La	Lang sandy loam	0.24	1.848	7.7	10%
Lb	Lang sandy loam, deep	0.24	2.712	11.3	15%
So	Sycamore silt loam	0.43	2.795	6.5	9%
W	Water		0		13%
TOTAL			7.4	52.3	100%
Weighted Average			0.14		


Project Area
Isoerodent R Value
10
20
40
50
60
80
100
120
140
160
180
200
220

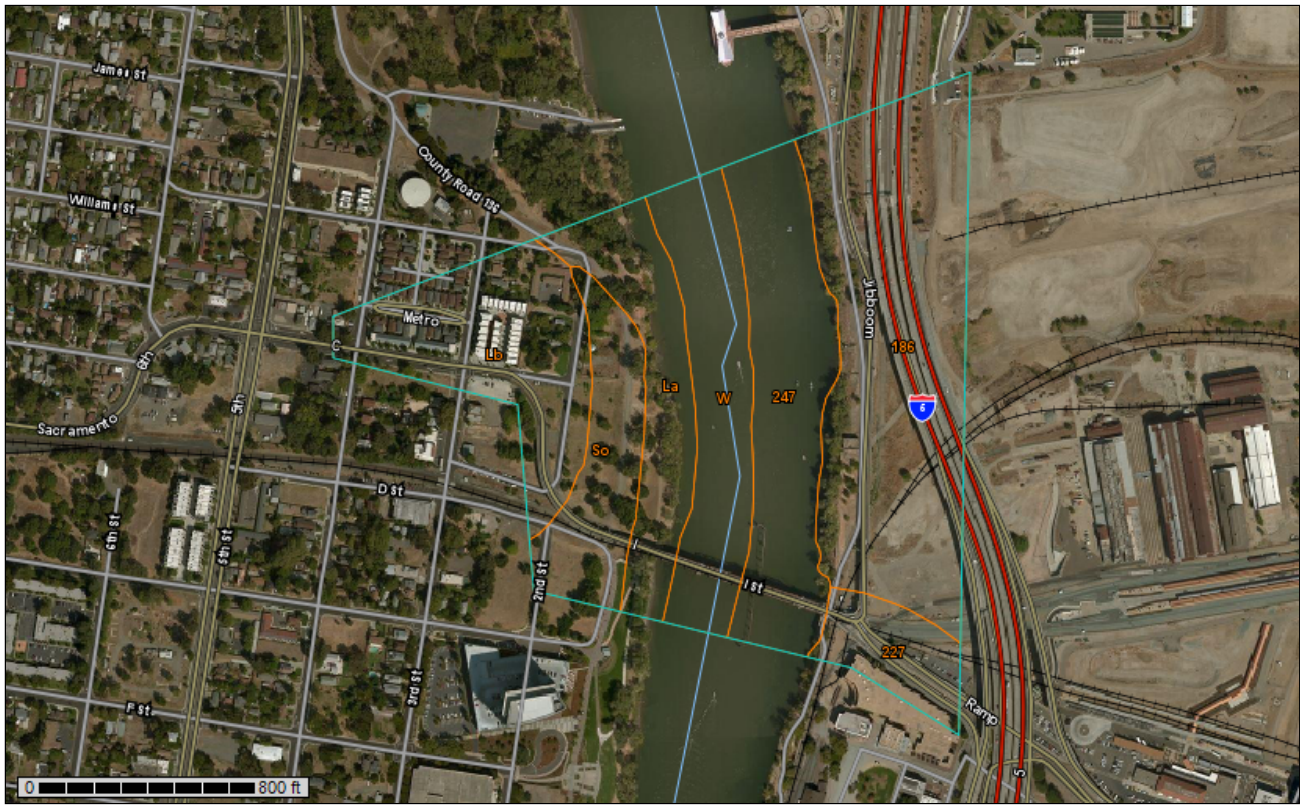
Search

Map Unit Legend

Sacramento County, California (CA067)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
186	Orthents-Urban land complex, 0 to 2 percent slopes	23.0	31.1%
227	Urban land	3.8	5.1%
247	Water	12.3	16.6%
Subtotals for Soil Survey Area		**39.1**	**52.8%**
Yolo County, California (CA113)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
La	Lang sandy loam	7.7	10.4%
Lb	Lang sandy loam, deep	11.3	15.2%
So	Sycamore silt loam	6.5	8.8%
W	Water	9.4	12.7%
Subtotals for Soil Survey Area		**34.9**	**47.2%**
Totals for Area of Interest		**74.0**	**100.0%**

Soil Map

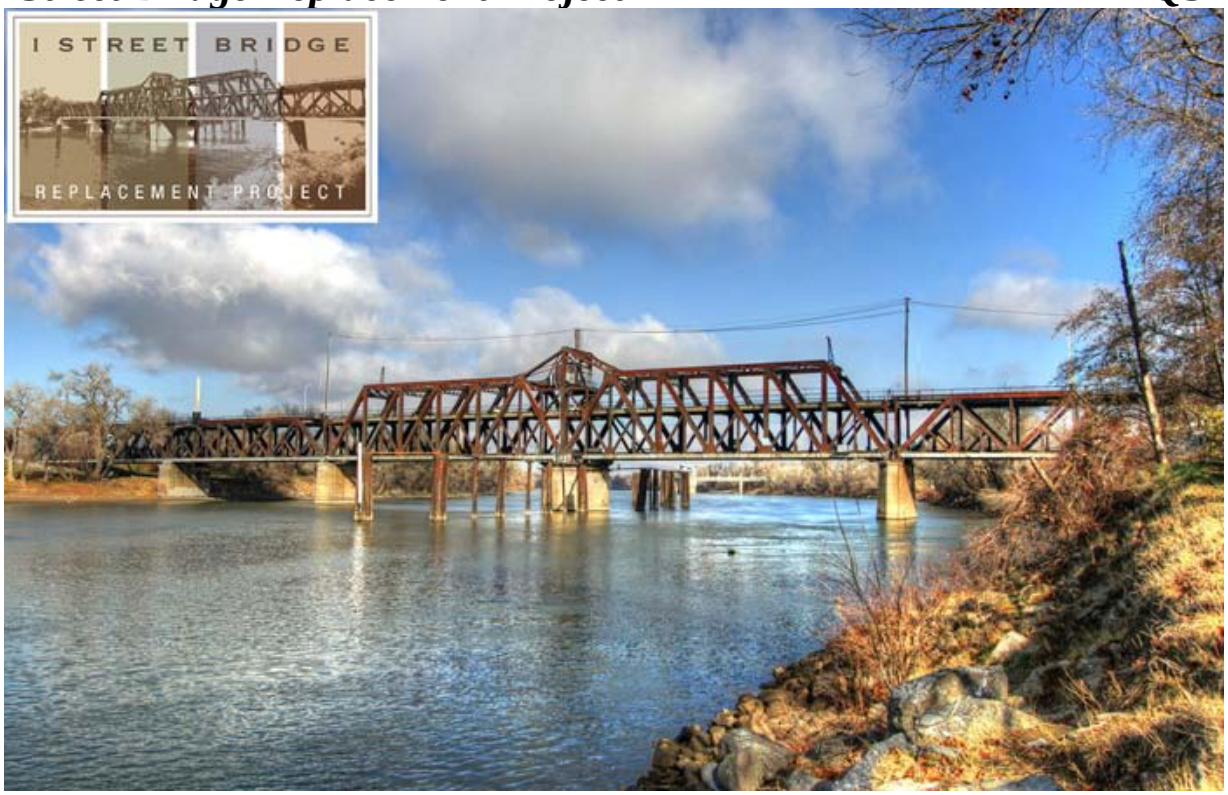
Scale (not to scale)



Warning: Soil Map may not be valid at this scale.

You have zoomed in beyond the scale at which the soil map for this area is intended to be used. Mapping of soils is done at a particular scale. The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000. The design of map units and the level of detail shown in the resulting soil map are dependent on that map scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.



Air Quality Study Report

I Street Bridge Replacement Project

Sacramento and Yolo Counties

Federal Project No.: BRLS 5002(164)

November 2016

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Air Quality Study Report

I Street Bridge Replacement Project
Sacramento and Yolo Counties
Federal Project No.: BRLS 5002(164)

November 2016

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ACRONYMS AND ABBREVIATIONS

AADT ..... Annual Average Daily Traffic
AB ..... Assembly Bill
ADA..... Americans with Disabilities Act
Cal/EPA ..... California Environmental Protection Agency
Caltrans..... California Department of Transportation
CARB ..... California Air Resources Board
CCAA ..... California Clean Air Act
CEQA..... California Environmental Quality Act
CFR..... Code of Federal Regulations
CO..... Carbon Monoxide
CO_2 ..... Carbon Dioxide
DOT ..... Department of Transportation
EO..... Executive Order
EPA..... Environmental Protection Agency
FCAA ..... Federal Clean Air Act
FHWA ..... Federal Highway Administration
FTA ..... Federal Transit Administration
FTIP ..... Federal Transportation Improvement Program
GHG..... Greenhouse Gases
HEI..... Health Effects Institute
IAC..... Interagency Consultation
IRIS..... Integrated Risk Information System
LED ..... Light-Emitting Diode
LOS..... Level of Service
MOVES ..... Motor Vehicle Emissions Simulator
MSAT ..... Mobile Source Air Toxic
MTIP ..... Metropolitan Transportation Improvement Program
MTP/SCS ..... Metropolitan Transportation Plan/Sustainable Communities Strategy
NAAQS ..... National Ambient Air Quality Standards
NATA ..... National Air Toxics Assessment
NEPA ..... National Environmental Policy Act
NHTSA..... National Highway Traffic Safety Administration
NO..... Nitric Oxide
NO_2 ..... Nitrogen Dioxide
NOA ..... Naturally Occurring Asbestos
NOAA..... National Oceanic and Atmospheric Administration
NO_X ..... Nitrogen Oxides
O_3 ..... Ozone
OSTP ..... Office of Science and Technology Policy
POAQC ..... Project of Air Quality Concern
Pb..... Lead
PM..... Particulate Matter
PPB..... Parts Per Billion
PPD..... Pounds Per Day
PPM ..... Part Per Million
PVC..... Polyvinyl Chloride
ROG..... Reactive Organic Gases
RTIP..... Regional Transportation Improvement Program

RTP ..... Regional Transportation Plan
SACMET ..... Sacramento Regional Travel Demand Model
SACOG ..... Sacramento Area Council of Governments
SB ..... Senate Bill
SCS ..... Sustainable Communities Strategy
SIP ..... State Implementation Plan
SMAQMD ..... Sacramento Metropolitan Air Quality Management District
SO_2 ..... Sulfur Dioxide
SVAB ..... Sacramento Valley Air Basin
TAC ..... Toxic Air Contaminant
TPY ..... Tons Per Year
USGS ..... U.S. Coast Guard
VOC ..... Volatile Organic Compound
VMT ..... Vehicle Miles Traveled
YSAQMD ..... Yolo-Solano Air Quality Management District

1.0 INTRODUCTION

1.1 Purpose of the Air Quality Study Report

The purpose of the Air Quality Study Report is to identify the air quality and climate change effects of the I Street Bridge Replacement Project (proposed project). Both short-term construction emissions and long-term effects related to the ongoing operation of the alternatives are discussed in this section. This analysis focuses on air pollution from two perspectives: daily emissions and pollutant concentrations. Emissions refer to the quantity of pollutants released into the air. Concentrations refer to the amount of pollutant material per volumetric unit of air.

1.2 Scope and Content of the Air Quality Study Report

The Air Quality Study Report includes:

- A project description documenting design assumptions that are relevant to the air quality analysis. The project description includes a description of the alternatives under consideration.
- Regional meteorology and climate information, including a description of the area's topography.
- A description of applicable regulations and agencies involved with air quality in the area. The description outlines air quality standards on both the federal and State levels.
- A discussion of the project area and affected environment, including monitor locations and data, area conformity designations and classifications, and the location of sensitive receptors.
- Project-level transportation conformity documentation related to the Federal Clean Air Act (FCAA).
- Results of air quality analyses, including a description of methodologies and assumptions.
- Potential impacts of the project on air quality: direct, indirect, temporary, and permanent.
- Potential avoidance, minimization and/or mitigation measures.

1.3 Summary

The Cities of Sacramento and West Sacramento together have recognized the need for more river crossings. The I Street Bridge Replacement project includes construction of a new bridge upstream of the existing I Street Bridge. The new bridge would cross the Sacramento River between the Sacramento Railyards area and the West Sacramento Washington planned developments and provide a new bicycle, pedestrian, and automobile crossing. The existing I Street Bridge would continue to be used by the railroad. The approach viaducts to the existing I Street Bridge would be demolished, which should result in better access to the water front in both cities.

The findings of the Air Quality Study Report are as follows:

Project Operations

- Transportation Conformity - The proposed project is exempt from all Transportation Conformity requirements per Section 93.126 in Title 40 of the Code of Federal Regulations (CFR). The specific exemption is related to widening narrow pavements or reconstructing bridges without additional travel lanes. Sacramento Area Council of Governments (SACOG) confirmed this finding on August 23, 2016.
- Regional Emissions - Regional emissions were estimated for volatile organic compounds (VOC), nitrogen oxides (NO_X), carbon monoxide (CO), particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), particulate matter 10 microns or less in diameter (PM_{10}), and greenhouse gases (GHGs). The emissions analysis indicates that the Build Alternatives would generally result in a negligible change in emissions (compared to the No Build Alternative in 2020 and 2040.
- Mobile Source Air Toxics (MSAT) - According to Federal Highway Administration (FHWA) guidance, the proposed project is classified as a Project with Low Potential MSAT Effects. There would be no appreciable difference in overall MSAT emissions among the various Build Alternatives There could be increases in MSAT levels in a few localized areas where vehicle miles traveled (VMT) increases. However, vehicle and fuel regulations will bring about significantly lower MSAT levels for the project area in the future than today.
- Naturally Occurring Asbestos (NOA) and Structural Asbestos - There is no occurrence of asbestos reported within 25 miles of the project area. Although it is not anticipated that construction activity would encounter NOA, the proposed project dust control measures would effectively control unanticipated NOA exposure through a variety of required control measures including watering. In addition, it is not anticipated that construction activity would encounter structural asbestos.
- Lead - It is not anticipated that construction of the proposed project would involve disturbance of soils containing high levels of aerially-deposited lead, painting or modification of structures with lead-based coatings using sandblasting and other activities related to lead paint removal or disturbance.

Project Construction

Construction emissions would include fugitive dust and exhaust from equipment, trucks, and worker vehicles. Construction activity would generate emissions related to VOC, NO_X, CO, $PM_{2.5}$, PM_{10}, and GHGs. To control the generation of construction-related PM_{10} emissions, the project proponent will follow Standard Specification Section 14, "Environmental Stewardship," which addresses the contractor's responsibility on many items of concern, such as: air pollution; protection of lakes, streams, reservoirs, and other water bodies; use of pesticides; safety; sanitation; convenience for the public; and damage or injury to any person or property as a result of any construction operation. Section 14-9.02, which includes specifications relating to air pollution control by complying with air pollution control rules, regulations, ordinances, and statutes that apply to work performed under the contract, including air pollution control rules, regulations, ordinances, and statutes provided in Government Code Section 11017 (Public Contract Code Section 10231). Section 14-9.03 is directed at controlling dust. In addition, Caltrans Standard Specifications for construction (Sections 10 and 18 for dust control and Section 39-3.06 for asphalt concrete plants) will be adhered to in order to reduce emissions generated by construction equipment. Implementation of the following avoidance, minimization, and/or mitigation measures would reduce fugitive dust air quality emissions resulting from construction activities:

AQ-1 The contractor shall obtain all necessary Sacramento County and Yolo County permits and approvals and shall follow all required County laws and procedures and respect to best management practices, grading and excavation for the proposed project and all construction-related and emission-generating activities.

AQ-2 Construction of the project shall comply with Sacramento Metropolitan Air Quality Management District (SMAQMD) and Yolo-Solano Air Quality Management District (YSAQMD) Basic Construction Emission Control Practices, Exhaust Control Practices, and Fugitive PM Dust Control Practices.

AQ-3 Construction activity within The Railyards Specific Plan area shall comply with the mitigation measures contained in the adopted Mitigation Monitoring and Reporting Plan for The Railyards development (City of Sacramento 2007).

2.0 PROJECT DESCRIPTION

2.1 Project Location

The proposed project is located over the Sacramento River between Sacramento and West Sacramento, approximately 1,000 feet north of the existing I Street Bridge (**Figure 2-1**). The proposed project limits starting within the City of Sacramento consist of Railyards Boulevard from 200 feet east of Bercut Drive on the east, continuing west over the Sacramento River into the City of West Sacramento along C Street, and terminating approximately 100 feet west of the 5th Street intersection. The proposed project limits also extend along Bercut Drive approximately 500 feet north of Railyards Boulevard, along Jibboom Street 550 feet north of Railyards Boulevard and 300 feet south of Railyards Boulevard, along 3rd Street 50 feet north and south of C Street, along 4th Street 50 feet north and south of C Street, and along 5th Street 50 feet north and south of C Street. The total length of the proposed project is approximately 0.42 miles along C Street and Railyards Boulevard.

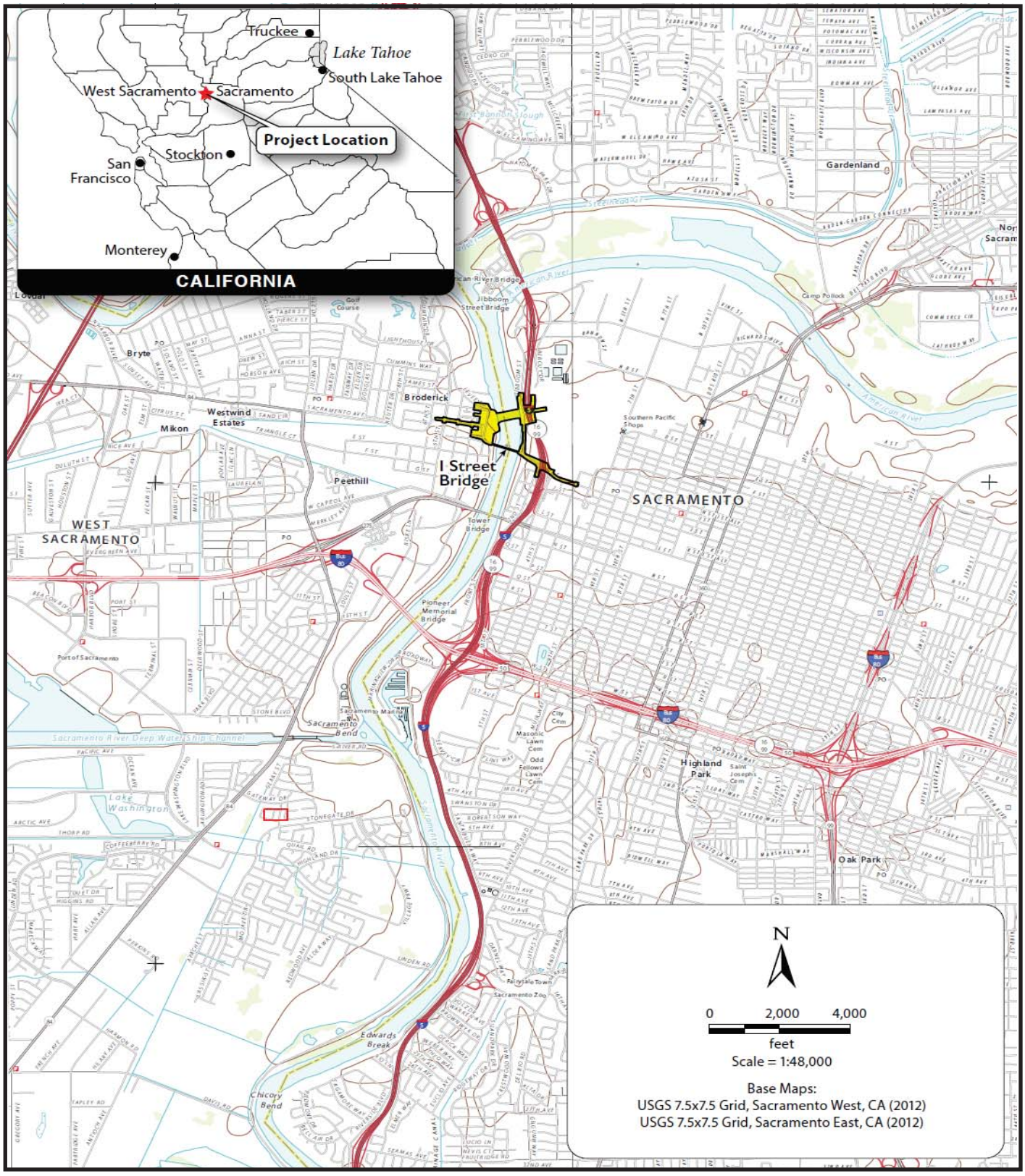
2.2 Purpose and Need

The proposed project would construct a new bridge over the Sacramento River between Sacramento and West Sacramento to replace the vehicle crossing that is currently provided by the existing I Street Bridge. Construction of the proposed project has independent utility; the proposed project is not dependent on other projects or improvements to meet the purpose and need.

2.2.1 Purpose

The purpose and objectives of the project are listed below.

- The project should construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge from C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento, consistent with the adopted findings of the Sacramento River Crossings Alternatives Study for Bridge Location 2 in the North Market Area.
- The new bridge should meet the requirements of the Neighborhood Friendly Bridge definition that the City of Sacramento City Council adopted by resolution on October 18, 2011, which is defined by the following elements.
  - A facility whose primary function is local connectivity rather than regional travel and primarily serves short local trips.
  - A bridge which serves all users, including motorists, bicyclists, pedestrians, low energy vehicles, and public transit riders.
  - A bridge with aesthetics and dimensions which are architecturally pleasing and contextually appropriate for the adjacent neighborhoods.
  - A bridge that does not exceed or expand the already-planned capacity of the approach roadways (i.e., no widening of approaches just to accommodate bridge flows).
  - A facility which is designed with a target speed equal to or less than the approach roadways.
  - A bridge which reduces the growth in vehicle miles traveled in the adjacent communities.



SOURCE: ICF International, 2015.

I-Street Bridge Replacement Project
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FIGURE 2-1

REGIONAL LOCATION

  - A bridge that does not connect directly to streets which are primarily residential in character.
  - A bridge that is consistent with the Need and Purpose statement [the adopted Sacramento River Crossings Alternatives Study statement] as articulated.

- In addition to the Neighborhood Friendly Bridge definition, the project should include pedestrian and bicycle facilities in the new public crossing that meet Americans with Disabilities Act (ADA) requirements, and facilitate connections to and from the new crossing and the Sacramento River Parkway and Riverfront Park trails.
- The proposed project also would need to construct a movable bridge that satisfies the vertical clearance and river navigation requirements of the U.S. Coast Guard (USCG).
- The project design should not preclude future addition of a streetcar, a separate, stand-alone project being developed by Sacramento and West Sacramento.
- The new bridge also is intended to improve the connectivity to, and accessibility of, businesses, recreational areas, and new or redevelopment opportunity sites located in the urban core of Sacramento and West Sacramento.

2.2.2 Need

The proposed project is needed for the following reasons.

- The existing I Street Bridge does not fully comply with current design and traffic operation standards due to the following conditions.
  - I Street Bridge limits or restricts traffic capacity and multimodal use. The current bridge width is not sufficient to provide adequate traffic operations, bicycle lanes, or the ability for transit service across the bridge.
  - The I Street Bridge and the four associated approach structures are on the federal eligible bridge list for federal funds for replacement and/or rehabilitation through the Highway Bridge Program (HBP). The I Street Bridge has been classified as functionally obsolete, and the existing approach structures have been classified as structurally deficient. The Sacramento and West Sacramento have decided to pursue replacement through the HBP.
  - As adopted by the Sacramento City Council, new crossings of the Sacramento River between the Cities Sacramento and West Sacramento shall be Neighborhood Friendly. In coordination with staff from the City of West Sacramento and SACOG, the definition for a Neighborhood Friendly Bridge was developed by the City of Sacramento and the Sacramento City Council adopted the definition by resolution in October 2011. The replacement bridge structure is required to be consistent with the Neighborhood Friendly Bridge definition.
  - In addition to the Neighborhood Friendly Bridge requirements, lack of ADA compliance, non-standard and non-continuous sidewalks, and lack of bicycle facilities discourage walking and bicycling on the existing I Street Bridge.
  - Section 9 of the Rivers and Harbors Act requires any local, State, or federal agency planning to construct a bridge over a navigable waterway to apply for a bridge permit through the USCG. The USCG requires the new bridge to meet or exceed the existing vertical clearance along the river, which is currently set by the Highway 50 Pioneer Bridge. In order to comply with the Neighborhood Friendly Bridge definition

and meet the USCG requirements for navigation clearance, the new bridge will need to be movable.

- The SACOG 2035 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) identifies that a proposed streetcar will cross over the new bridge from Sacramento to West Sacramento. While the streetcar will be a separate, stand-alone project, the bridge design must not preclude the future addition of a streetcar.
- Limited connectivity to the riverfront reduces the potential to achieve planned urban development and redevelopment of opportunity sites identified in the adopted plans for the Sacramento and West Sacramento.

2.3 Alternatives

This section describes the proposed action and the design alternatives that were developed to meet the identified need through accomplishing the defined purpose(s), while avoiding or minimizing environmental impacts. The alternatives under consideration are one bridge alignment for the new bridge over the Sacramento River and two alternatives for portions of the roadway design in Sacramento.

- City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection
  - Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive
  - Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive
- No-Build (No-Project) Alternative

2.3.1 Build Alternatives

One proposed alignment is for the new bridge to cross over the Sacramento River. A new approximately 860-foot bridge, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides, is proposed. The bridge would include two fixed-span approach structures, approximately 200 feet and 270 feet in length, that tie into the Sacramento and West Sacramento banks of the river, respectively (**Figure 2-2**).

The center span of the bridge would be an approximately 330-foot movable span that meets the USCG requirements. Roadway improvements on Railyards Boulevard in the City of Sacramento and C Street in the City of West Sacramento also are proposed. In Sacramento, two alternatives for portions of the roadway design are being considered. **Figure 2-2**, above, depicts the proposed project and the roadway design alternatives, described below.

- City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection
  - Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive
  - Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive

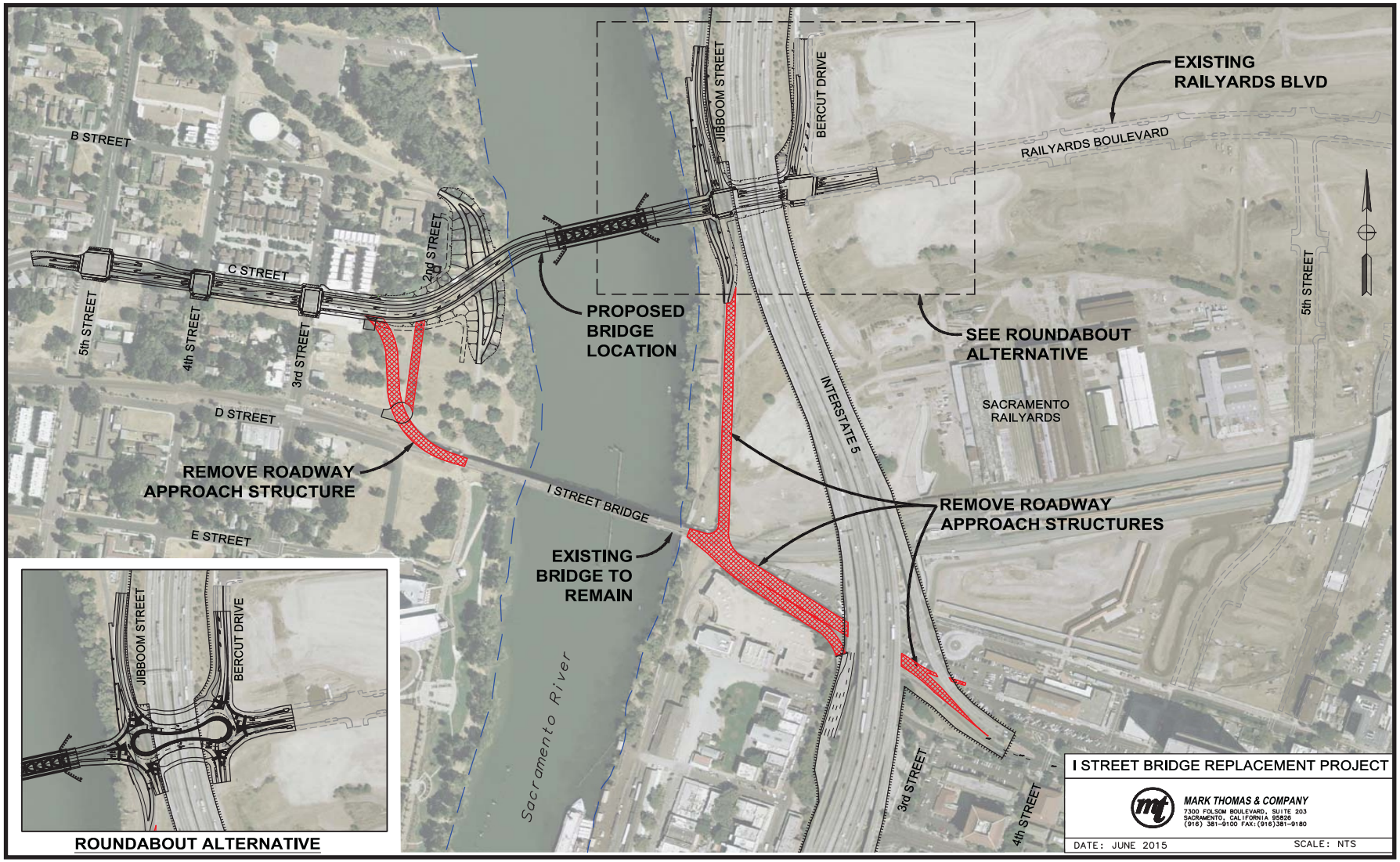


FIGURE 2-2

BUILD ALTERNATIVE

In the City of Sacramento, Alternative 1 consists of a signalized intersection at Jibboom Street and Bercut Drive, while Alternative 2 consists of a roundabout between these two intersections. Beyond the Jibboom Street and Bercut Drive intersections, the remaining project elements and limits in the City of Sacramento are similar under both alternatives.

2.3.1.1 Common Design Features of the Build Alternatives

The proposed project would construct a new bridge over the Sacramento River between Sacramento and West Sacramento to replace the vehicular crossing that is provided by the existing I Street bridge. The proposed project would facilitate vehicular and multimodal traffic over the river in order to reduce traffic congestion, improve safety, and remove a number of structurally deficient or functionally obsolete bridges that have reached the limit of their design life. While the existing I Street Bridge over the Sacramento River would remain in-place, the approach structures leading up to the bridge from both directions would be demolished.

An abbreviated version of the common design features of the build alternatives are listed below. Refer to the Draft Environmental Document for a detailed discussion of the alternatives.

New Bridge Construction and Roadway Modifications

Bridge Construction

The proposed project would construct a new bridge over the Sacramento River. The total bridge length would be approximately 860 feet long, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides of the bridge. The bridge would include two fixed-span approach structures that tie into the Sacramento and West Sacramento banks of the river and are approximately 200 feet and 270 feet in length, respectively. The center span of the bridge would be a movable span that meets the USCG requirements. The movable span is anticipated to be approximately 330 feet in length. The bridge soffit elevation would be set 3 feet above the 200-year water surface elevation to comply with the Central Valley Flood Protection Board freeboard requirements. The two fixed-span approach structures would be 72 feet wide, with a superstructure depth (or total bridge thickness) of approximately 6 feet. Each approach structure would be a two-span bridge.

Roadway Modifications

City of Sacramento. In Sacramento, Bercut Drive would be modified from Railyards Boulevard north approximately 500 feet. Bercut Drive would be designed to have two northbound lanes at the Railyards Boulevard intersection, tapering down to one northbound lane at the northern project limits, and one southbound lane. Improvements to Bercut Drive south of Railyards Boulevard are not part of, nor needed for, the proposed project and would be constructed if needed as part of a separate future project.

Proposed improvements on Jibboom Street would extend 550 feet north of Railyards Boulevard. The roadway would consist of one travel lane in each direction, on-street Class II bike lanes, sidewalk along the west side of the roadway, and retaining walls of various heights along both sides of the road. Extension of Jibboom Street south of Railyards Boulevard is not included with, nor needed for, the proposed project and would be constructed if needed as part of a separate future project.

City of West Sacramento. Between the bridge touchdown location along C Street in West Sacramento and the 4th Street/C Street intersection, the roadway would consist of one westbound travel lane, two eastbound travel lanes (the two eastbound travel lanes would taper down to one eastbound lane east of the 3rd Street intersection), a center left-turn lane, on-street Class II bike lanes, on-street parking along the north side of the roadway, and sidewalks along both sides of the roadway. As the roadway through this section currently consists of the proposed number of travel lanes, the widening through this area is primarily needed to support the Class II bike lanes and wider sidewalks.

Along C Street between 4th Street and 5th Street, the roadway would consist of one travel lane in each direction, left-turn lanes, on-street Class II bike lanes, and sidewalks along both sides of the road. All of the improvements through this section would be accommodated within the existing roadway limits.

Class I Bikeway and Levee Modifications and Improvements

City of Sacramento

The existing Class I Sacramento River Parkway along Jibboom Street would be reconstructed approximately 500 feet north and 300 feet south of Railyards Boulevard as part of the proposed project. In order to maintain a continuous off-street Class I path along this section, the path would be grade-separated under the proposed bridge structure. Cyclists and pedestrians approaching Railyards Boulevard in either direction would have the option to continue along the path under the new structure, avoiding the need to cross the roadway. Cyclists and pedestrians who are traveling along the path also would have the option to connect to Railyards Boulevard and cross over the proposed bridge into West Sacramento or turn east into Sacramento. Due to the limited horizontal clearance between the river and the Interstate-5 (I-5) viaduct structure, retaining walls would be needed along the path to account for the vertical elevation difference between Jibboom Street and the path that continues under the proposed bridge structure. The maximum retaining wall height along the bike path would be 16 feet.

City of West Sacramento

The proposed project would require improvements to the existing levee along the West Sacramento side of the river, where the proposed bridge alignment would connect to C Street. The existing levee does not meet current standards required by Title 23 of the California Code of Regulations. Extending approximately 300 feet north and south of the proposed C Street

alignment, the levee cross-section would be reconstructed to meet current design standards, which would require 3:1 side slopes on the landside and waterside of the levee, and a 20-foot-wide crown at the top of the levee. The levee improvements also would include a slurry cutoff wall extending to a depth of 110 feet below the original ground elevation. In addition, the proposed roadway profile would be approximately 6 feet higher than the original ground elevation as it crosses over the levee. In order to maintain access to the levee for inspection and maintenance services, access roads would be constructed from the new roadway to the top of the improved levee section. The proposed grading for the levee would require relocation of the existing water tower that is located along 2nd Street, just north of the proposed C Street alignment. The tower would be relocated to the northwest, approximately 43 feet from its existing location.

The new levee maintenance road also would serve as the future Class I River Walk Park trail extension in West Sacramento. Similar to the trail improvements proposed as part of the project in Sacramento, the trail would be grade-separated under the proposed bridge structure. Cyclists and pedestrians approaching C Street in either direction would have the option to continue along the trail under the new structure, avoiding the need to cross the roadway. Cyclists and pedestrians who are traveling along the trail also would have the option to connect to C Street to cross over the proposed bridge into Sacramento or head west on C Street.

Structure Demolition and Roadway Modifications

Following completion of the new bridge connections at Railyards Boulevard and C Street, traffic would be diverted to the new bridge, and the four existing approach structures to the I Street Bridge would be removed. Bridge numbers 24C0364L, 24C0364R, 22-0033, and 22C0154 would be demolished and the foundations would be removed to a depth of three feet below the original ground elevation. Encroachment permits from California Department of Transportation (Caltrans) and Union Pacific Railroad would be needed to complete the bridge removal. The existing I Street Bridge is owned and operated by Union Pacific Railroad and would continue to remain in-place and used by trains following construction of the new bridge.

As part of the removal of the existing approach structures, the proposed project would include modifications to I Street within the City of Sacramento from the southbound I-5 on-ramp east to the 5th Street intersection. The modification would include signing and striping revisions, demolition of existing roadway sections that are no longer required, and removal of bridge abutments and foundations.

Staging, Storage, and Proposed Access during Construction

Two staging areas would be used to store materials and equipment during construction, such as pipe materials, precast manholes and drop inlets, steel girders, piles, and rebar, along with the construction equipment when not in use. One area would be located south of Railyards Boulevard under I-5 in Sacramento; the other area would be located west of the landward side of the levee, south of the new bridge location in West Sacramento. The staging area located along Railyards Boulevard would be accessed via the existing intersection at Jibboom Street. The staging area in West Sacramento would be accessed via the existing 2nd Street connection at 3rd Street, south of C Street. The staging areas would be in use throughout the construction duration; the areas would be returned to their pre-project conditions at the completion of the project.

Utility Relocations

A number of public and private utilities would need to be relocated or adjusted to grade as part of the project, including existing water, sewer, gas, electric, and communication facilities within Jibboom Street, Bercut Drive, C Street, and 2nd Street.

Traffic Management and Detours during Construction

While most of the project would be constructed outside of existing roadways, some areas would require temporary detours or staged construction.

Along Jibboom Street at the proposed Railyards Boulevard intersection, the new roadway profile would be raised approximately 6 feet above the original ground elevation. To maintain access to the existing Jibboom Street viaduct south of Railyards Boulevard during the roadway construction, a temporary access road would be needed. The proposed temporary access road would connect to the existing Jibboom Street viaduct abutment approximately 350 feet south of Railyards Boulevard. The temporary road would then continue under I-5 and connect to the Railyards Boulevard/Bercut Drive intersection. The temporary road would require placement of temporary fill material and a roadway structural section that would be removed after construction of the new bridge. Traffic traveling north along Jibboom Street would continue north along Bercut Drive to access the Richards Boulevard/I-5 interchange.

In order to complete the improvements at Jibboom Street and Railyards Boulevard, Jibboom Street would be closed to traffic approximately 600 feet north of Railyards Boulevard. Traffic traveling south along Jibboom Street to continue over the existing I Street Bridge into West Sacramento would be detoured over to Bercut Drive at Richards Boulevard. Traffic would then use the temporary access road to connect to the Jibboom Street viaduct structure. The temporary access road would be in place for approximately two years, after which traffic would use the new roadways and new bridge.

The Sacramento River Parkway trail along Jibboom Street also would require temporary re-routing during construction. The temporary alignment for the trail would follow the temporary Jibboom Street alignment south of Railyards Boulevard. Cyclists and pedestrians would then continue following a detour north along Bercut Drive to Richards Boulevard, where they could then connect back to the Parkway on the west side of I-5. The detour would be in place for approximately two years.

During construction, traffic along C Street would be maintained along the existing approach structure until the new bridge is constructed.

Project Construction Sequence

New bridge and roadway construction would occur first, followed by demolition of the four approach structures that connect to the existing I Street Bridge. Once the new bridge and roadways are constructed, traffic would be diverted to the new bridge in order to allow demolition adjacent to the existing bridge. Construction of the project is expected to take approximately 30 months.

2.3.1.2 Unique Features of Build Alternatives

In both Sacramento and West Sacramento, two alternatives for portions of the roadway design are being considered.

City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection

Alternative 1 consists of a signalized intersection at Jibboom Street and Bercut Drive, while Alternative 2 consists of a roundabout between these two intersections. Beyond the Jibboom Street and Bercut Drive intersections, the remaining project elements and limits are similar under both alternatives.

Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive

Under Alternative 1, Railyards Boulevard would be extended west over the Sacramento River; east of Bercut Drive. Railyards Boulevard would consist of two westbound lanes and one eastbound lane. Between Jibboom Street and Bercut Drive, Railyards Boulevard would consist of two westbound lanes and three eastbound lanes; two eastbound lanes would be trapped into left-turn lanes onto Bercut Drive, and one eastbound lane would continue along Railyards Boulevard. West of the Jibboom Street intersection, Railyards Boulevard would consist of one lane in each direction.

Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive

Under Alternative 2, Railyards Boulevard would be extended west over the Sacramento River. East of Bercut Drive, Railyards Boulevard would consist of two westbound lanes and one eastbound lane. Between Jibboom Street and Bercut Drive, Railyards Boulevard would consist of a roundabout with two lanes in each direction. One westbound lane would be a trap onto northbound Jibboom Street, and one westbound lane would continue onto the new bridge. One eastbound lane would be trapped into left-turn lanes onto Bercut Drive, and one eastbound lane would continue along Railyards Boulevard. West of Jibboom Street, Railyards Boulevard would consist of one lane in each direction.

City of West Sacramento Residential Access

The new C Street alignment would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. The project would construct a new connection to C Street approximately 150 feet east of the 3rd Street intersection that would continue north approximately 300 feet. The new connection would then make a 90-degree left turn and connect to 3rd Street approximately 300 feet north of C Street. The proposed access would be consistent with the City of West Sacramento's design standards for a public alley, which consists of 30-foot wide public right of way, supporting a 20-foot travel way, a 5-foot sidewalk, and a 5-foot buffer to adjacent parcels.

2.3.2 No Build Alternative (No Project)

Under the No Build Alternative, the existing I Street Bridge would remain in use for vehicle, bicycle, and pedestrian access between Sacramento and West Sacramento. No changes to traffic patterns on I Street or C Street would occur. The four approach structures would remain in place and in use; and there would be no changes to existing roadways, levees or Class I bikeways.

Improvements and development of transportation infrastructure would continue following the General Plans of both cities, the Sacramento Railyards Specific Plan (approved December 2007), and the Washington Specific Plan (adopted May 1996). The Sacramento Railyards Specific Plan identifies the extension of Railyards Boulevard west to a Tee intersection at Jibboom Street. Railyards Boulevard at Bercut Drive would consist of two westbound lanes and one eastbound lane. The same number of lanes on Railyards Boulevared would extend west to the intersection with Jibboom Street; at this point, the left westbound lane on Railyards

Boulevard would become a dedicated left-turn onto southbound Jibboom Street, and the right westbound lane would be a dedicated right-turn onto northbound Jibboom Street.

In West Sacramento, future changes to C Street would be based on the Washington Specific Plan, which identifies 12-foot-wide sidewalks and 7-foot-wide Class II bike lanes along the roadway. The connection to the I Street Bridge would not change.

2.4 Traffic Data

Emission estimations in this Air Quality Study Report are based on traffic data prepared specifically for the proposed project. **Tables 2-1** through **2-3** include regional VMT, local I Street Bridge traffic, truck percentages, truck volumes, and vehicle speeds for analysis years 2020 (Opening Year) and 2040 (Horizon Year). Results of the traffic report did not indicate operational differences between Build Alternatives. Regionally, VMT is identical for the Build Alternatives and emissions were estimated using one set of modeling criteria. Intersection LOS data is included in Appendix A.

TABLE 2-1: REGIONAL DAILY VEHICLE MILES TRAVELED SCENARIO

Speed Bin (Miles per Hour)	Existing	2020 No Build	2020 Build	2020 Build (Assignment Only with No Build Trip Distribution) /a/	2040 No Build	2040 Build
0 to 5	10,831	23,115	26,313	27,462	45,228	46,570
5 to 10	99,612	247,813	236,914	237,352	215,353	210,335
10 to 15	255,751	485,798	479,664	475,228	523,992	522,669
15 to 20	6,900,927	8,022,904	8,033,368	8,014,868	9,416,568	9,440,712
20 to 25	3,111,475	3,755,849	3,775,925	3,795,090	4,148,518	4,143,003
25 to 30	2,817,867	3,548,211	3,535,996	3,540,091	4,098,876	4,078,851
30 to 35	5,947,106	6,798,081	6,810,531	6,829,579	8,410,131	8,392,596
35 to 40	6,455,786	7,562,424	7,561,704	7,463,811	10,439,175	10,437,519
40 to 45	6,170,254	6,505,070	6,484,291	6,549,145	8,072,425	8,062,851
45 to 50	2,845,156	3,339,511	3,332,376	3,270,060	4,323,896	4,278,366
50 to 55	5,576,842	5,919,822	6,059,937	6,022,703	6,696,787	6,788,274
55 to 60	10,183,389	10,358,822	10,260,639	10,324,497	14,011,452	13,987,203
60 to 65	3,596,138	3,420,478	3,417,600	3,418,463	2,771,748	2,775,909
65 to 70	1,862,884	1,896,617	1,896,436	1,896,924	2,238,821	2,238,862
TOTAL	**55,834,020**	**61,884,514**	**61,911,694**	**61,865,273**	**75,412,968**	**75,403,720**
Difference from Existing	--	*6,050,494*	*6,077,675*	*6,031,253*	*19,578,948*	*19,569,701*
Difference from No Build	--	--	27,180	(19,241)	--	(9,247)

/a/ For 2020 Build conditions, two different methods were used to estimate vehicle miles traveled. The first method is where the travel forecasting model trip assignment step is run in isolation. Under this method, all of the regional trip origins and destinations remain constant from the no build scenario. The only travel pattern change is the route that vehicle trips take between these origins and destinations since the short-term travel response to the bridge being opened is likely limited to route choices (i.e., individuals are not likely to change their work location because of short relocation of the bridge). Over a longer period of time, other travel behavior may change including destination locations and travel modes, which are represented by the full model run method. This full run likely overstates the level of travel change that would occur while assignment only run may not fully capture the full range of travel behavior effects. Hence, both estimates are provided and reviewers are cautioned to note that the modified Sacramento Regional Travel Demand Model (SACMET) used to generate these forecasts represents the entire six-county SACOG region and the network changes being made for this analysis are limited to a handful of links just a few 100 feet long.
SOURCE: Caltrans, *Traffic Study Report for the I Street Bridge Replacement Project*, 2016.

TABLE 2-2: REGIONAL DAILY VEHICLE MILES TRAVELED FOR TRUCKS AND NON-TRUCKS

Alternatives	Total VMT	Non-Truck VMT	Truck VMT	% Trucks
EXISTING				
2014	55,834,020	42,906,395	12,927,625	23%
YEAR 2020				
No Build	61,884,514	47,588,223	14,296,291	23%
Build	61,911,694	47,609,243	14,302,451	23%
Net Change from Existing	*6,077,675* *10.9%*	*4,702,849* *11.0%*	*1,374,826* *10.6%*	*0%*
Net Change from No Build to Build	*27,180* *0.04%*	*21,021* *0.1%*	*6,160* *0.04%*	*0%*
Build (2020) with No Build Trip Distribution	61,865,273	47,573,741	14,291,532	23%
Net Change from Existing	*6,031,253* *10.8%*	*4,667,346* *10.9%*	*1,363,907* *10.6%*	*0%*
Net Change from No Build to Build	*(19,241)* *(0.03%)*	*(14,482)* *(0.03%)*	*(4,759)* *(0.03%)*	*0%*
YEAR 2040				
No Build	75,412,968	57,349,183	18,063,785	24%
Build	75,403,720	57,340,789	18,062,931	24%
Net Change from Existing	*19,569,701* *35.0%*	*14,434,394* *33.6%*	*5,135,306* *39.7%*	*1%*
Net Change from No Build to Build	*(9,247)* *(0.01%)*	*(8,394)* *(0.01%)*	*(5,343)* *(0.00%)*	*0%*

SOURCE: Caltrans, *Traffic Study Report for the I Street Bridge Replacement Project*, 2016.

TABLE 2-3: I STREET BRIDGE DAILY TRAFFIC VOLUMES FOR TRUCKS AND NON-TRUCKS

Alternatives	Total ADT	Non-Truck ADT	Truck ADT	% Trucks
EXISTING				
2014	12,564	10,540	2,024	16%
YEAR 2020				
No Build	17,274	14,593	2,681	16%
Build	25,479	20,975	4,504	18%
Net Change from Existing	*12,915* *103%*	*10,435* *99%*	*2,480* *123%*	*0%*
Net Change from No Build to Build	*8,205* *47%*	*6,382* *44%*	*1,823* *68%*	*2%*
YEAR 2040				
No Build	25,644	21,510	4,134	16%
Build	33,310	27,582	5,728	17%
Net Change from Existing	*20,746* *165%*	*17,042* *162%*	*3,704* *183%*	*0%*
Net Change from No Build to Build	*7,666* *30%*	*6,072* *28%*	*1,594* *39%*	*1%*

SOURCE: Caltrans, *Traffic Study Report for the I Street Bridge Replacement Project*, 2016.

3.0 AFFECTED ENVIRONMENT; ENVIRONMENTAL CONSEQUENCES; AND AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

3.1 Affected Environment

This section discusses federal and State laws and regulations, air quality standards and attainment designations, the physical setting, and environmental consequences.

3.1.1 Regulatory Setting

The FCAA, as amended, is the primary federal law that governs air quality while the California Clean Air Act (CCAA) is its companion state law. These laws, and related regulations by the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and the State level standards called California Ambient Air Quality Standards (CAAQS), have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: CO, nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), which is broken down for regulatory purposes into PM_{10} and $PM_{2.5}$, and sulfur dioxide (SO_2). In addition, federal and State standards exist for lead (Pb), and State standards exist for visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The NAAQS and State standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision. Both State and federal regulations also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Air Quality

A combination of federal, State, and local laws and regulations govern air quality in the project area. The laws and regulations related to the relevant jurisdictions are discussed below.

Federal Air Quality Standards

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under National Environmental Protection Agency (NEPA). In addition to this environmental analysis, a parallel conformity requirement under the FCAA also applies. The sections of FCAA directly applicable to the proposed project include Title I (Non-attainment Provisions) and Title II (Mobile Source Provisions). Title I requirements are implemented for the purpose of attaining NAAQS for the following criteria pollutants: (1) O_3, (2) NO_2, (3) SO_2, (4) PM_{10} and $PM_{2.5}$, (5) CO, and (6) Pb. The NAAQS are shown in **Table 3-1**. along with principal health effects, atmospheric effects, and sources of each criteria pollutant.

Title II of the FCAA pertains to mobile sources, such as cars, trucks, buses, and planes. Reformulated gasoline, automobile pollution control devices, and vapor recovery nozzles on gas pumps are a few mechanisms that U.S. EPA uses to regulate mobile air emission sources. The provisions of Title II resulted in tailpipe emission standards for vehicles, which have strengthened in recent years to improve air quality. For example, the standards for NO_2 emissions have been lowered substantially, and the specification requirements for cleaner burning gasoline have been made more stringent.

TABLE 3-1: STATE AND FEDERAL CRITERIA AIR POLLUTANT STANDARDS, EFFECTS, AND SOURCES

Pollutant	Averaging Time	State /i/ Standard	Federal /i/ Standard	Principal Health and Atmospheric Effects	Typical Sources
Ozone (O_3)/b/	1 hour 8 hours	0.09 ppm 0.070 ppm	--- /d/ 0.075 ppm (4th highest in 3 years)	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute.	Low-altitude ozone is almost entirely formed from reactive organic gases/volatile organic compounds (ROG or VOC) and nitrogen oxides (NO_X) in the presence of sunlight and heat. Common precursor emitters include motor vehicles and other internal combustion engines, solvent evaporation, boilers, furnaces, and industrial processes.
Carbon Monoxide (CO)	1 hour 8 hours 8 hours (Lake Tahoe)	20 ppm 9.0 ppm /a/ 6 ppm	35 ppm 9 ppm ---	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical ozone. Colorless, odorless.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale. :
Respirable Particulate Matter (PM_{10})/b/	24 hours Annual	50 µg/m^3 20 µg/m^3	150 µg/m^3 --- /b/ (expected number of days above standard < or equal to 1)	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many toxic & other aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke & vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources.
Fine Particulate Matter ($PM_{2.5}$) /b/	24 hours Annual	--- 12 µg/m^3	35 µg/m^3 12.0 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the $PM_{2.5}$ size range. Many toxic & other aerosol and solid compounds are part of $PM_{2.5}$.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical and photochemical reactions involving other pollutants including NO_X, sulfur oxides (SO_x), ammonia, and ROG.

TABLE 3-1: STATE AND FEDERAL CRITERIA AIR POLLUTANT STANDARDS, EFFECTS, AND SOURCES

Pollutant	Averaging Time	State /i/ Standard	Federal /i/ Standard	Principal Health and Atmospheric Effects	Typical Sources
Nitrogen Dioxide (NO_2)	1 hour Annual	0.18 ppm 0.030 ppm	0.100 ppm /f/ (98th percentile over 3 years) 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain & nitrate contamination of stormwater. Part of the "NO_x" group of ozone precursors.	Motor vehicles and other mobile or portable engines, especially diesel; refineries; industrial operations.
Sulfur Dioxide (SO_2)	1 hour 3 hours 24 hours	0.25 ppm --- 0.04 ppm	0.075 ppm /g/ (98th percentile over 3 years) 0.5 ppm /g/ 0.14	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.
Lead (Pb)	Monthly Rolling 3-month average Calendar Quarter	1.5 µg/m^3 --- 	--- 0.15 µg/m^3 1.5 µg/m^3	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from older gasoline use may exist in soils along major roads.
Sulfate	24 hours	25 µg/m^3	---	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	---	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea. Strong odor.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.
Visibility Reducing Particles (VRP)	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70%	---	Reduces visibility. Produces haze. NOTE: not directly related to the Regional Haze program under the Federal Clean Air Act, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas. However, some issues and measurement methods are similar.	See particulate matter above. May be related more to aerosols than to solid particles.

TABLE 3-1: STATE AND FEDERAL CRITERIA AIR POLLUTANT STANDARDS, EFFECTS, AND SOURCES

Pollutant	Averaging Time	State /i/ Standard	Federal /i/ Standard	Principal Health and Atmospheric Effects	Typical Sources
Vinyl Chloride /c/	24 hours	0.01 ppm	---	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes

Adapted from CARB Air Quality Standards chart (http://www.arb.ca.gov/research/aaqs/aaqs2.pdf).

Notes: ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; ppb = parts per billion (thousand million); n/a = not applicable

/a/Rounding to an integer value is not allowed for the State 8-hour CO standard. A violation occurs at or above 9.05 ppm.
/b/Annual PM_{10} NAAQS revoked October 2006; was 50 $\mu g/m^3$. 24-hr. $PM_{2.5}$ NAAQS tightened October 2006; was 65 $\mu g/m^3$. Annual $PM_{2.5}$ NAAQS tightened from 15 $\mu g/m^3$ to 12 $\mu g/m^3$ December 2012 and secondary annual standard set at 15 $\mu g/m^3$.
/c/The CARB has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM_{10} and, in larger proportion, $PM_{2.5}$.
/d/Both the CARB and U.S. EPA have identified lead and various organic compounds that are precursors to ozone and $PM_{2.5}$ as toxic air contaminants. There are no exposure criteria for adverse health effect due to toxic air contaminants, and control requirements may apply at ambient concentrations below any criteria levels specified above for these pollutants or the general categories of pollutants to which they belong.
/e/Prior to 6/2005, the 1-hour ozone NAAQS was 0.12 ppm. Emission budgets for 1-hour ozone are still be in use in some areas where 8-hour ozone emission budgets have not been developed, such as the S.F. Bay Area.
/f/The 65 $\mu g/m^3$ $PM_{2.5}$ (24-hour) NAAQS was not revoked when the 35 $\mu g/m^3$ NAAQS was promulgated in 2006. The 15 $\mu g/m^3$ annual $PM_{2.5}$ standard was not revoked when the 12 $\mu g/m^3$ standard was promulgated in 2012. The 0.08 ppm 1997 ozone standard is revoked FOR CONFORMITY PURPOSES ONLY when area designations for the 2008 0.75 ppm standard become effective for conformity use (7/20/2013). Conformity requirements apply for all NAAQS, including revoked NAAQS, until emission budgets for newer NAAQS are found adequate, SIP amendments for the newer NAAQS are approved with a emission budget, U.S. EPA specifically revokes conformity requirements for an older standard, or the area becomes attainment/unclassified. SIP-approved emission budgets remain in force indefinitely unless explicitly replaced or eliminated by a subsequent approved SIP amendment. During the "Interim" period prior to availability of emission budgets, conformity tests may include some combination of build vs. no build, build vs. baseline, or compliance with prior emission budgets for the same pollutant.
/g/Final 1-hour NO_2 NAAQS published in the Federal Register on 2/9/2010, effective 3/9/2010. Initial area designation for California (2012) was attainment/unclassifiable throughout. Project-level hot-spot analysis requirements do not currently exist. Near-road monitoring starting in 2013 may cause redesignation to nonattainment in some areas after 2016.
/h/U.S. EPA finalized a 1-hour SO_2 standard of 75 ppb in June 2010.
/i/State standards are "not to exceed" or "not to be equaled or exceeded" unless stated otherwise. Federal standards are "not to exceed more than once a year" or as described above.
/j/Secondary standard, set to protect public welfare rather than health. Conformity and environmental analysis address both primary and secondary NAAQS.

CAA Conformity Requirements for Transportation

The conformity requirement is based on FCAA Section 176(c), which prohibits the U.S. Department of Transportation (DOT) and other federal agencies from funding, authorizing, or approving plans, programs or projects that do not conform to State Implementation Plans (SIPs) for attainting the NAAQS. Transportation conformity applies to highway and transit projects and takes place on two levels: the regional—or, planning and programming level—and the project level. A proposed project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and maintenance (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. U.S. EPA regulations at 40 CFR 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for State standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for CO, NO_2, O_3, PM_{10}, and $PM_{2.5}$, and in some areas (although not in California), SO_2. California has attainment or maintenance areas for all of these transportation-related criteria pollutants except SO_2, and also has a nonattainment area for lead; however, lead is not currently required by the FCAA to be covered in a transportation conformity analysis. Regional conformity is based on the emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years for the RTP, and 4 years for the FTIP. The RTP and FTIP conformity use travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the FCAA and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), FHWA, and Federal Transit Administration (FTA), make determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the FCAA. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept, scope, and "open-to-traffic" schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of a project-level analysis.

Conformity analysis at the project-level includes verification that the project is included in the regional conformity analysis and a "hot-spot" analysis if an area is "nonattainment" or "maintenance" for CO and/or particulate matter (PM_{10} or $PM_{2.5}$). A region is "nonattainment" if one or more of the monitoring stations in the region measure a violation of the relevant standard and the U.S. EPA officially designates the area nonattainment. Areas that were previously designated as nonattainment areas but subsequently meet the standard may be officially re-designated to attainment by the U.S. EPA, and are then called "maintenance" areas. A "hot-spot" analysis is essentially the same, for technical purposes, as a CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific procedural and documentation standards for projects that require a hot-spot analysis. In general, projects must not cause the "hot-spot"-related standard to be violated, and must not cause any increase in the number and severity of violations in nonattainment areas. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

State Air Quality Standards

Air quality in California is also regulations under the CCAA. In California, the CCAA is administered by CARB at the State level and by the air quality management districts and air pollution control districts at the regional and local levels. A major element of the CCAA is the requirement that local air districts which are in violation of the CAAQS must prepare air quality management or attainment plans that identify air quality problems, causes, trends and actions to be taken to attain and maintain California's air quality standards by the earliest practicable date. The CAAQS are shown in **Table 3-1**, above.

Local and Regional Implementation of Federal and State Requirements

In the project area, the regulation of air quality on the east side of the Sacramento River is under the jurisdiction of the SMAQMD. The regulation of air quality on the west side of the Sacramento River is under the jurisdiction of the YSAQMD. In addition, the SACOG is responsible for ensuring that transportation projects and plans do not impede the region's clean air goals.

Sacramento Metropolitan Air Quality Management District (SMAQMD)

The SMAQMD operates at the local level with primary responsibility for attaining and maintaining the federal and State ambient air quality standards in Sacramento County. The SMAQMD works jointly with U.S. EPA, CARB, SACOG, other air districts in the Sacramento region, county and city transportation and planning departments, and various non-governmental organizations to improve air quality through a variety of programs. These programs include the adoption of regulations, policies and guidance, extensive education and public outreach programs, as well as emission reducing incentive programs.

The SMAQMD developed the California Environmental Quality Act (CEQA) Guide to Air Quality Assessment to provide methods for the analysis and review of air quality impacts from land use development projects.[1] The primary purpose of the CEQA Guide is to provide useful tools to quickly identify proposed development projects that may have a significant adverse effect on air quality. This document includes screening approaches and specific methods for calculating emissions, with references to applicable models. This document also provides mitigation strategies developers can integrate into their projects to reduce air quality impacts. Significance thresholds to assess potential impacts for projects undergoing CEQA review are shown in **Table 3-2**.

Yolo-Solano Air Quality Management District (YSAQMD)

The YSAQMD is responsible for protecting human health and property from the harmful effects of air pollution. Established in 1971 by a joint powers agreement between the Yolo and Solano County boards of supervisors, the YSAQMD is governed by an air quality management board composed of representatives from both the County Boards of Supervisors and Mayors/City council members from the cities within the District. YSAQMD has jurisdiction over all of Yolo County and the northeast portion of Solano County, from Vacaville on the west, to Rio Vista on the south.

[1]SMAQMD, *CEQA Guide to Air Quality Assessment*, Revised November 2014.

TABLE 3-2: SMAQMD THRESHOLDS OF SIGNIFICANCE		
	Construction Phase	**Operational Phase**
ALL PROJECTS SUBJECT TO CEQA		
Mass Emission Thresholds		
NOx (ozone precursor)	85 pounds/day	65 pounds/day
ROG (VOC) (ozone precursor)	NONE	65 pounds/day
PM_{10}	Zero (0). If all feasible BACT/BMPs are applied, then 80 pounds/day and 14.6 tons/year	Zero (0). If all feasible BACT/BMPs are applied, then 80 pounds/day and 14.6 tons/year
$PM_{2.5}$	Zero (0). If all feasible BACT/BMPs are applied, then 82 pounds/day and 15 tons/year	Zero (0). If all feasible BACT/BMPs are applied, then 82 pounds/day and 15 tons/year
LAND DEVELOPMENT AND CONSTRUCTION PROJECTS		
Greenhouse Gas Emissions (GHG) Thresholds		
GHG as CO2e	1,100 metric tons/year	10,000 metric tons/year

NOTES:
The SMAQMD Board of Directors adopted air quality thresholds of significance for criteria pollutants on March 28, 2002, via resolution AQMD2002018. Official
The SMAQMD Board of Directors adopted GHG thresholds on October 23, 2014, via resolution AQMD2014-028
GHG operational emissions in excess of 1,100 metric ton/year must be reduced to 1,100 metric tons or by 21.7 percent relative to the No Action Taken scenario.
SOURCE: SMAQMD, *CEQA Guide to Air Quality Assessment*, Revised November 2014.

The YSAQMD prepared the Handbook for Assessing and Mitigating Air Quality Impacts as an advisory document to provide Lead Agencies, consultants, and project applicants with procedures for addressing air quality impacts in environmental documents.[2] The Handbook contains the following components:

- Preliminary actions Lead Agencies can take to reduce air quality impacts prior to beginning the CEQA process;
- Criteria and thresholds for determining whether a project may have a significant adverse air quality impact;
- Project screening methods, specific procedures and modeling protocols for quantifying and analyzing air quality impacts; and
- Measures that can be implemented to mitigate air quality impacts.

The YSAQMD quantitative significance thresholds are shown in **Table 3-3**. The thresholds apply to construction and operational impacts. The YSAQMD was part of the working group that developed the draft regional GHG thresholds for the Sacramento area, which SMAQMD adopted and are shown in **Table 3-2**. Accordingly, YSAQMD has draft thresholds that are consistent with what is shown in **Table 3-2** for SMAQMD, but have not been formally adopted.

[2]YSAQMD, *Handbook for Assessing and Mitigating Air Quality Impacts*, July 11, 2007.

TABLE 3-3: YSAQMD THRESHOLDS OF SIGNIFICANCE FOR CRITERIA POLLUTANTS OF CONCERN

Pollutant	Thresholds of Significance
ROG	10 tons per year
NO_X	10 tons per year
PM_{10}	80 pounds per day
CO	Violation of a State Ambient Air Quality Standard for CO

SOURCE: YSAQMD, *Handbook for Assessing and Mitigating Air Quality Impacts*, July 11, 2007.

Sacramento Area Council of Governments (SACOG)

The SACOG is an association of local governments in the six-county Sacramento Region. Members include the Counties of El Dorado, Placer, Sacramento, Sutter, Yolo and Yuba as well as 22 cities. The SACOG provides transportation planning and funding for the region, and serves as a forum for the study and resolution of regional issues. In addition to preparing the region's Long-Range Transportation Plan, SACOG approves the distribution of affordable housing in the region and assists in planning for transit, bicycle networks, clean air and airport land uses.

SACOG prepared the FTIP and MTP/SCS. The FTIP is known as the Metropolitan Transportation Improvement Program (MTIP) in the Sacramento Region. It is a short-term listing of surface transportation projects that: receive federal funds, are subject to a federally required action, or are regionally significant. Apart from some improvements to the region's airports and the Port of Sacramento, all regionally significant transportation projects and federally funded capital projects are part of the MTIP. This means that many-but not all-transit, highway, local roadway, bicycle and pedestrian investments are included in the MTIP. SACOG, as the federally designated MPO for the six-county Sacramento Region, prepares and adopts the MTIP every two years.

Only projects included in the MTP/SCS may be incorporated into the MTIP. The MTIP derives all its projects either directly from the MTP/SCS or indirectly from the policies within it. The MTP/SCS is the long range policy and planning document while the MTIP is the short range implementing document that enables those planned project to begin work. Specifically, the MTIP lists those projects from the MTP/SCS that have committed or reasonably available funding and intend to begin a phase of work during the four years of the MTIP.

3.1.2 Physical Setting

Climate and Topography

The following climate and topography discussion was included in the Conformity Analysis for the 2015/2018 MTIP.[3] The Sacramento Valley is a basin bounded by the Sierra Nevada Mountain Range to the east and the Coastal Mountain Ranges to the west. Topography in the Sacramento Valley is generally flat, with elevations anywhere from slightly below sea level near the Sacramento/San Joaquin Delta to over 2,150 feet above sea level at the Sutter Buttes. Hot dry summers and mild rainy winters characterize the Mediterranean climate of the Sacramento Valley Air Basin (SVAB). During the year the temperature may range from 20 to 115 degrees Fahrenheit with summer highs usually in the 90s and winter lows occasionally below freezing. Average annual rainfall is about 20 inches with about 75 percent occurring during the rainy

[3]SACOG, *Conformity Analysis for the 2015/18 Metropolitan Transportation Improvement Program and Amendment #4 to the Metropolitan Transportation Plan and Sustainable Communities Strategy 2035*, adopted September 2014.

season generally from November through March. The prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north.

The mountains surrounding the SVAB create a barrier to airflow, which can trap air pollutants when certain meteorological conditions exist. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells lie over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air and allows air pollutants to become concentrated in a stable volume of air. The surface concentrations of particulate matter pollutants are highest when these conditions are combined with smoke or when temperature inversions trap cool air, fog and pollutants near the ground.

The ozone season (May through October) in the Sacramento Valley is characterized by stagnant morning air or light winds, with the delta sea breeze arriving in the afternoon out of the southwest.

In addition, longer daylight hours provide a plentiful amount of sunlight to fuel photochemical reactions between ROG and NOx, which result in ozone formation. Likewise, $PM_{2.5}$ peak concentrations typically occur during the winter season (November – February) when temperature inversion and low wind speeds trap and concentrate $PM_{2.5}$ emissions, cooler temperature and high humidity increase the secondary formation of particulates.

As an air basin, air quality in the Sacramento region is impacted not only by pollutants generated within the region, but also by pollutants generated in the San Francisco Bay Area and the San Joaquin Valley, which are carried into the Sacramento region by Delta breezes. The effect of pollutants transported from the San Francisco Bay Area or from the San Joaquin Valley on air quality in the Sacramento region can vary from substantial to inconsequential on any given day, largely determined by accompanying meteorological conditions. Thus, the success of the Sacramento region in attaining better air quality is partially contingent on the achievement of better air quality in nearby areas that affect Sacramento's air quality.

Description of NAAQS AND CAAQS Pollutants

The primary pollutants of concern in the project area are O_3 and its precursors, reactive organic gases (ROG) and NO_X, as well as CO, PM_{10}, and $PM_{2.5}$. O_3, PM_{10}, and $PM_{2.5}$ are considered to be regional pollutants because they affect air quality on a regional scale. NO_2 reacts photo-chemically with ROG to form O_3, while PM_{10} and $PM_{2.5}$ can form from chemical reaction of atmospheric chemicals, including NO_X, sulfates, nitrates, and ammonia. These processes can occur at some distance downwind of the source of pollutants. Pollutants, such as CO, are considered to be local pollutants because they tend to disperse rapidly with distance from the source. Although PM_{10} and $PM_{2.5}$ are regional pollutants, they can also be localized pollutants, as direct emissions of PM_{10} from automobile exhaust can accumulate in the air locally near the emission source.

The following is a brief overview of O_3, CO, PM_{10}, and $PM_{2.5}$. MSAT and CO_2 are also discussed, even though there are currently no adopted standards to control these pollutants.

Ozone

O_3 is a respiratory irritant that increases susceptibility to respiratory infections. It is also an oxidant that can cause substantial damage to vegetation and other materials. O_3 is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. The O_3

precursors ROG and NO_X react in the atmosphere in the presence of sunlight to form O_3. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, O_3 pollution is primarily a problem in the summer.

Carbon Monoxide

CO is a public health concern because it combines readily with hemoglobin and reduces the amount of oxygen transported in the bloodstream. CO can cause health problems such as fatigue, headache, confusion, dizziness, and even death. Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.
Inhalable Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. Particulate matter less than 10 microns in diameter, about 1/7th the thickness of a human hair, is referred to as PM_{10}. Particulate matter that is 2.5 microns or less in diameter, roughly 1/28th the diameter of a human hair, is referred to as $PM_{2.5}$. Major sources of PM_{10} include motor vehicles; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. $PM_{2.5}$ results from fuel combustion (from motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. In addition, PM_{10} and $PM_{2.5}$ can be formed in the atmosphere from gases such as SO_2, NO_X, and ROG.

PM_{10} and $PM_{2.5}$ pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. PM_{10} and $PM_{2.5}$ can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances, such as lead, sulfates, and nitrates, can cause lung damage directly. These substances can be absorbed into the blood stream and cause damage elsewhere in the body; they can also transport absorbed gases such as chlorides or ammonium into the lungs and cause injury. Whereas particles 2.5 to 10 microns in diameter tend to collect in the upper portion of the respiratory system, particles 2.5 microns or less are so tiny that they can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, and contribute to haze and reduce regional visibility.

Lead

As a result of regulatory efforts to reduce the content of Pb in gasoline, the contribution of Pb from the transportation sector has been substantially reduced. Industrial activities are the major source of Pb emissions to the atmosphere. CARB reports the effects from inhalation of Pb include impaired blood formation and nerve conduction. Pb can adversely affect the nervous, reproductive, digestive, immune, and blood-forming systems. Symptoms can include fatigue, anxiety, short-term memory loss, depression, weakness in the extremities, and learning disabilities in children. Pb also causes cancer.

Toxic Air Contaminants/Mobile Source Air Toxics

Toxic air contaminants (TACs) are pollutants that may result in an increase in mortality or serious illness or that may pose a present or potential hazard to human health. Health effects of TACs include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases that lead to death. In 1998, following a 10-year scientific assessment process, CARB identified particulate matter from diesel-fueled engines as a TAC. Compared to other air toxics that CARB has identified and controlled, diesel particulate matter emissions are estimated to be responsible for about 70 percent of the total ambient air toxics risk.[4]

The CCAA made controlling air toxic emissions a national priority, by which Congress mandated that U.S. EPA regulate 188 air toxics. These substances are also known as hazardous air pollutants. In U.S. EPA's latest rule, Control of Emissions of Hazardous Air Pollutants from Mobile Sources (Federal Registry, Vol. 72, No. 37, page 8430, February 2007), it identified a group of 93 compounds emitted from mobile sources that are listed in its Integrated Risk Information System (IRIS). The IRIS is a comprehensive database of specific substances known to cause human health effects. In addition, U.S. EPA identified the following seven compounds as priority MSATs.

- Acrolein
- Benzene
- 1,3-Butadiene
- Diesel particulate matter/diesel exhaust organic gases
- Formaldehyde
- Naphthalene
- Polycyclic organic matter

While FHWA considers these the priority MSATs, the list is subject to change and may be adjusted in consideration of future rules. To address emissions of MSATs, U.S. EPA has issued a number of regulations, including the 2007 rule mentioned above, that will dramatically decrease MSATs through cleaner fuels and cleaner engines.

The issue of air toxics is an emerging area of analysis and continuing research. Although much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques available for assessing project-specific health impacts from MSATs are currently limited. Given the emerging state of the science and of project-level analysis techniques, there are no established criteria for determining when MSAT emissions should be considered a significant issue in the context of NEPA.

FHWA released guidance for factoring mobile source health risks into project-level decision making under NEPA in December 2012.[5] However, U.S. EPA has not established regulatory concentration targets for the seven relevant MSAT pollutants appropriate for use in the project development process. The FHWA recommends MSAT analyses to be conducted using U.S. EPA's latest version of Motor Vehicle Emissions Simulator (MOVES) model, released on October 30, 2012, which estimates on- and off-road MSAT emissions from motor vehicles. FHWA's guidance advises the assessment of MSATs in NEPA documents.[6]

[4]CARB, Risk *Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*, 2000.

[5]FHWA, *Memorandum: Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA*, December 6, 2012.

[6]*Ibid*.

Greenhouse Gases

The warming trend of the earth's atmosphere, also known as climate change, is related to the release of GHG into the atmosphere. The GHGs of main concern are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Changes in climate may lead to sea level rise and changes to agriculture production, water supply, ecosystem sustainability and weather patterns. Increases in wildland fires and more extreme heat days leading to ozone formation have direct impacts to air quality in Sacramento County.

Existing Air Quality Conditions

The monitoring station closest to the project area is within the SMAQMD's jurisdiction. The Sacramento T Street Monitoring Station is located approximately 1.4 miles to the southeast (**Figure 3-1**). **Table 3-4** includes pollutant levels, the State and federal standards, and the number of exceedances recorded at the Sacramento T Street Monitoring Station. No standards were exceeded for CO, NO_2, or SO_2 between 2011 and 2014. The Federal 8-hour O_3 standard was was exceeded between 0 and 9 times annually, and the State 8-hour O_3 standard was exceeded 1 time in 2011 and 4 times in 2012. The State one-hour O_3 standard was exceeded 1 time in 2011 and 2012. The Federal PM_{10} and $PM_{2.5}$ standards were not exceeded between 2011 and 2014. The State 24-hour PM_{10} standard was exceeded 21 times in 2013 and 4 times in 2014. The State 24-hour $PM_{2.5}$ standard was exceeded 6 times in 2011 and 2 times in 2013.

Attainment Status

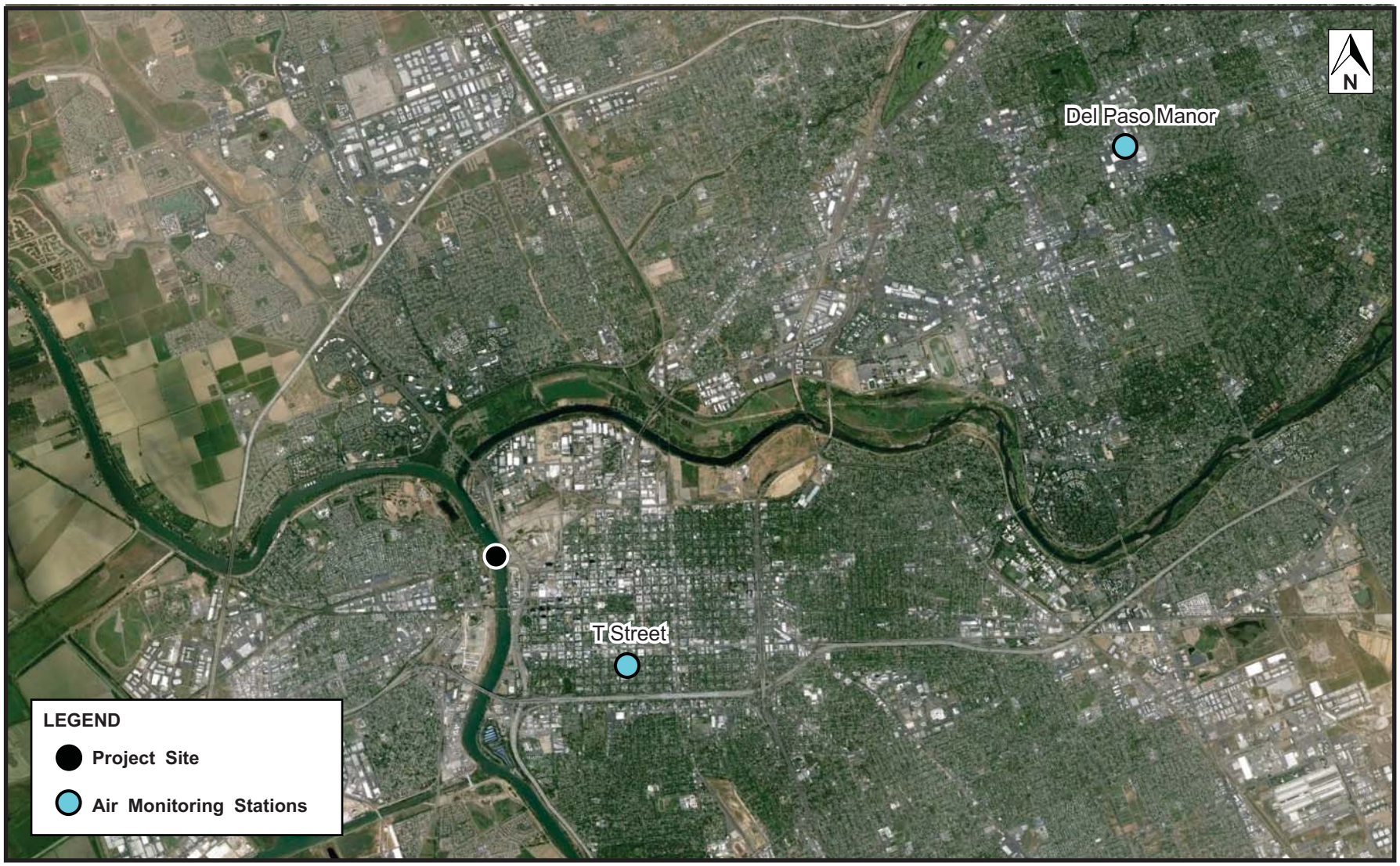
In the project area, the regulation of air quality on the east side of the Sacramento River is under the jurisdiction of SMAQMD. The U.S. EPA designates Sacramento County as nonattainment for O_3, $PM_{2.5}$, unclassified/attainment for Pb and NO_2, and maintenance for PM_{10} and CO.[7] The regulation of air quality on the west side of the Sacramento River is under the jurisdiction of YSAQMD. The U.S. EPA designates Yolo County as nonattainment for O_3, $PM_{2.5}$, unclassified/attainment for PM_{10}, Pb and NO_2, and maintenance for CO.[8] The conformity process does not address pollutants for which the area is attainment/unclassified, MSATs, other toxic air contaminants or hazardous air pollutants, or GHGs.

In accordance with the CCAA, CARB designates Sacramento and Yolo Counties as nonattainment for O_3, PM_{10}, and $PM_{2.5}$, attainment for CO, NO_2, SO_2, Pb, and sulfates, and unclassified for hydrogen sulfide and visibility reducing particles.[9]

Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. According to CARB, sensitive individuals refer to those segments of the population most susceptible to poor air quality (i.e., children, the elderly, and those with pre-existing serious health problems affected by air quality).[10] Land uses where sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities. convalescent centers, and retirement homes. **Figure 3-2** shows sensitive receptors within 500 feet of the project site.

[7]U.S. EPA, *The Green Book Nonattainment Areas for Criteria Pollutants*, January 30, 2015.
[8]*Ibid*.
[9]CARB, *Area Designations (Activities and Maps)*, June 24, 2015.
[10]CARB, *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005.



SOURCE: Terry A. Hayes Associates Inc., 2015.

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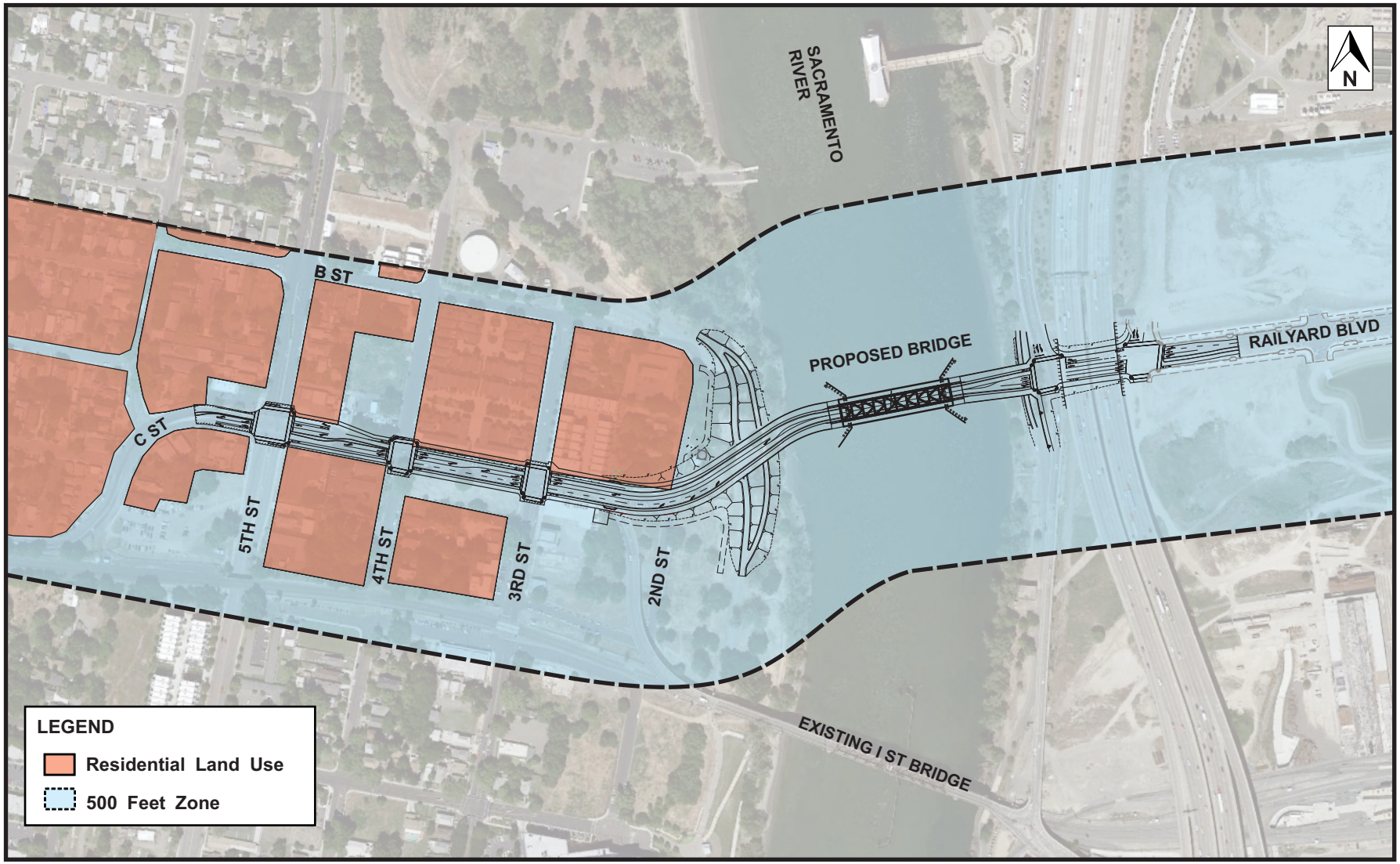
FIGURE 3-1

AIR MONITORING STATIONS

TABLE 3-4: 2011-2014 AMBIENT AIR QUALITY DATA IN PROJECT VICINITY

Pollutant	Pollutant Concentration & Standards	Calendar Year			
		2011	2012	2013	2014
CO	Maximum Federal 8-hr concentration (ppm)	2.27	1.51	n/a	n/a
	Days > 9.0 ppm (Federal 8-hr standard)	0	0		
	Maximum State 8-hr concentration (ppm)	2.27	1.60		
	Days > 9.0 ppm (State 8-hr standard)	0	0		
O_3	Maximum 1-hr Concentration (ppm)	0.100	0.104	0.091	0.085
	Days > 0.09 ppm (State 1-hr standard)	1	1	0	0
	Maximum State 8-hr Concentration (ppm)	0.087	0.093	0.068	0.072
	Days > 0.070 ppm (State 8-hr standard)	5	9	0	4
	Days > 0.075 ppm (Federal 8-hr standard)	1	4	0	0
NO_2	Maximum 1-hr Concentration (ppm)	0.0570	0.0620	0.0593	0.0647
	Days > 0.18 ppm (State 1-hr standard)	0	0	0	0
	Days > 0.188 ppm (Federal 1-hr standard)	0	0	0	0
SO_2	Maximum 24-hr Concentration (ppm) /a/	0.002	0.002	0.002	n/a
	Days > 0.04 ppm (State 24-hr standard)	0	0	0	
PM_{10}	Maximum 24-hr concentration ($\mu g/m^3$)	38.8	36.2	53.1	105.7
	Days > 50 $\mu g/m^3$ (State 24-hr standard)	0	0	21	4
	Days > 150 $\mu g/m^3$ (Federal 24-hr standard)	0	0	0	0
	Annual Arithmetic Mean ($\mu g/m^3$)	19.2	17.8	n/a	n/a
	Exceed State Standard (20 $\mu g/m^3$)	No	No	n/a	n/a
$PM_{2.5}$	Maximum 24-hr concentration ($\mu g/m^3$)	50.5	27.1	39.2	26.3
	Days > 35 $\mu g/m^3$ (Federal 24-hr standard)	6	0	2	0
	Annual Arithmetic Mean ($\mu g/m^3$)	10.1	8.3	10.0	8.0
	Exceed State Standard (12 $\mu g/m^3$)	No	No	No	No
	Exceed Federal Standard (12.0 $\mu g/m^3$)	No	No	No	No

NOTE:
n/a: data not available either due to air monitoring stations not recording pollutant concentrations or data entry not being relevant to the specific NAAQS/CAAQS standards mentioned in a given row.
Sulfur Dioxide and Carbon Monoxide data were not available at Sacramento T Street air monitoring station. Therefore, historical carbon monoxide and sulfur dioxide data from the next closest available air monitoring station, i.e. Sacramento- Del Paso Manor, were used.
SOURCE: CARB, Air Quality Data Statistics, http://www.arb.ca.gov/adam/topfour/topfour1.php, accessed June 22, 2015.



SOURCE: Terry A. Hayes Associates Inc., 2015.

FIGURE 3-2

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SENSITIVE RECEPTORS

3.2 Environmental Consequences

This section examines the degree to which the project alternatives may cause adverse or significant changes to air quality. Both short-term construction emissions and long-term effects related to the ongoing operation of the alternatives are discussed in this section.

3.2.1Transportation Conformity

The conformity requirement is based on FCAA Section 176(c), which prohibits the U.S. DOT and other federal agencies from funding, authorizing, or approving plans, programs or projects that do not conform to the SIP for attainting the NAAQS. The proposed project is exempt from all Transportation Conformity requirements per 40 CFR 93.126. The specific exemption is related to widening narrow pavements or reconstructing bridges without additional travel lanes. SACOG confirmed this finding on August 23, 2016.

3.2.2 Regional Emissions - Mobile Sources

Regional emissions were estimated using emission factors from the CARB EMFAC2014 model.[11] The traffic data for existing conditions was generated from a modified version of the 2008 base year SACMET model. Due to the 2008/09 recession, these results also describe 2013/2014 conditions. The region's loss of employment led to a decrease in travel activity after 2009 and traffic counts conducted for the City of Sacramento General Plan revealed that 2008 traffic levels had not rebounded fully by 2012. More recent 2013 and 2014 counts are similar to those from 2008 so there is evidence to support the base year model estimates as also representing 2014 conditions for this project. Existing emissions are greater than future emissions for all pollutants included in the analysis. Emission decreases from existing conditions to future years are due to improvements in engine efficiencies in addition to more advanced emission control technologies.

For 2020 Build Alternative conditions, two different methods were used to estimate vehicle miles traveled. The first method is where the travel forecasting model trip assignment step is run in isolation. Under this method, all of the regional trip origins and destinations remain constant from the no build scenario. The only travel pattern change is the route that vehicle trips take between these origins and destinations since the short-term travel response to the bridge being opened is likely limited to route choices (i.e., individuals are not likely to change their work location because of short relocation of the bridge). Over a longer period of time, other travel behavior may change including destination locations and travel modes, which are represented by the full model run method. This full run likely overstates the level of travel change that would occur while the assignment only run may not fully capture the full range of travel behavior effects. Both VMT and related emissions estimates are provided in this analysis. Reviewers are cautioned to note that the modified SACMET model used to generate these forecasts represents the entire six-county SACOG region and the network changes being made for this analysis are limited to a handful of links just a few hundred feet long. The VMT for both methods is show in **Table 2-1**, above.

Table 3-5 shows regional emissions for 2014 existing conditions and in 2020 and 2040 for the No Build and Build Alternatives. The emissions analysis indicates 2020 Build Alternative would generally result in a negligible change compared to the No Build Alternative. Pollutant emissions would decrease for most pollutants, except particulate matter. Despite decreased exhaust emissions, particulate matter emissions would increase in certain conditions due to re-entrained

[11]EMFAC2014 was released on December 30, 2014 by the CARB.

dust, break wear, and tire wear emissions. These emissions VMT would be directly correlated to the regional VMT relationship between the alternatives.

Because Caltrans has Statewide jurisdiction and the setting for projects varies so extensively across the State, Caltrans has not and will not develop thresholds of significance for CEQA. Further, because most air district thresholds have not been established by regulation or by delegation from a federal or State agency with regulatory authority over Caltrans, Caltrans is not required to adopt those thresholds in Caltrans' documents. Nevertheless, SMAQMD and YSAQMD thresholds of significance are provided for reference.

3.2.3 Mobile Source Air Toxics

Background

Controlling Air Toxic Emissions became a national priority with the passage of the FCAA Amendment of 1990, whereby Congress mandated that the U.S. EPA regulate 188 air toxics, also known as hazardous air pollutants. The U.S. EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Volume 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their IRIS. In addition, the U.S. EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future U.S. EPA rules. The 2007 U.S. EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines.

Motor Vehicle Emissions Simulator

According to the U.S. EPA, MOVES improves upon the previous MOBILE model in several key aspects: MOVES is based on a vast amount of in-use vehicle data collected and analyzed since the latest release of MOBILE, including millions of emissions measurements from light-duty vehicles. Analysis of this data enhanced the U.S. EPA's understanding of how mobile sources contribute to emissions inventories and the relative effectiveness of various control strategies. In addition, MOVES accounts for the significant effects that vehicle speed and temperature have on PM emissions estimates, whereas MOBILE did not. MOVES2010b includes all air toxic pollutants in the NATA that are emitted by mobile sources. The U.S. EPA has incorporated more recent data into MOVES2010b to update and enhance the quality of MSAT emission estimates. This data reflects advanced emission control technology and modern fuels, plus additional data for older technology vehicles. Based on an FHWA analysis using U.S. EPA's MOVES2010b model, **Figure 3-3** shows that even if VMT increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

The implications of MOVES on MSAT emissions estimates compared to MOBILE are: lower estimates of total MSAT emissions; significantly lower benzene emissions; significantly higher diesel PM emissions, especially for lower speeds. Consequently, diesel PM is projected to be the dominant component of the emissions total.

TABLE 3-5: ESTIMATED OPERATIONAL EMISSIONS

Emission Source	VOC		NOx		CO	$PM_{2.5}$		PM_{10}	
	tpy	ppd	tpy	ppd	tpy	tpy	ppd	tpy	ppd
2014 Existing Operational Emissions									
Existing Conditions	1,407	8,074	12,016	68,946	37,958	636	3,651	1,306	7,497
2020 Future Operational Emissions									
No Build	669	3,837	7,552	43,334	23,092	587	3,367	1,333	7,648
Build (Full Model Run) (% Change from 2020 No Build Alternative) (% Change from 2014 Existing Conditions)	669 0.0% (52%)	3,837 0.0% (52%)	7,557 0.1% (37%)	43,365 0.1% (37%)	23,101 0.0% (39%)	587 0.0% (8%)	3,368 0.0% (8%)	1,333 0.0% 2%	7,651 0.0% 2%
Net Change from 2020 No Build Alternative Net Change from 2014 Existing Conditions	0 (738)	0 (4,237)	5 (4,459)	31 (25,581)	9 (14,857)	0 (49)	1 (283)	0 27	3 154
Build (Assignment Only with Build Trip Distance) (% Change from 2020 No Build Alternative) (% Change from 2014 Existing Conditions)	668 (0.1%) (53%)	3,834 (0.1%) (53%)	7,547 (0.1%) (37%)	43,308 (0.1%) (37%)	23,082 0.0% (39%)	587 0.0% (8%)	3,367 0.0% (8%)	1,332 (0.1%) 2%	7,645 0.0% 2%
Net Change from 2020 No Build Alternative Net Change from 2014 Existing Conditions	1 (739)	3 (4,240)	(5) (4,469)	(57) (25,638)	(10) (14,876)	0 (49)	0 (284)	(1) (26)	(3) (148)
SMAQMD CEQA Significance Thresholds /a/	--	65	--	65	--	15	82	14.6	80
YSAQMD CEQA Significance Thresholds /a/	10	--	10	--	--	--	--	--	80
2040 Future Operational Emissions									
No Build	243	1,394	2,441	14,008	10,739	628	3,601	1,537	8,822
Build (% Change from 2020 No Build Alternative) (% Change from 2014 Existing Conditions)	243 0.0% (83)	1,394 0.0% (83)	2,441 0.0% (80)	14,009 0.0% (80)	10,737 0.0% (72)	628 0.0% (1)	3,601 0.0% (1)	1,537 0.0% 18	8,821 0.0% 18
Net Change from 2020 No Build Alternative Net Change from 2014 Existing Conditions	0 (1,164)	0 (6,680)	0 (9,575)	1 (54,937)	(2) (27,221)	0 (8)	0 (50)	0 231	(1) 1,324
SMAQMD CEQA Significance Thresholds /a/	--	65	--	65	--	15	82	14.6	80
YSAQMD CEQA Significance Thresholds /a/	10	--	10	--	--	--	--	--	80

NOTE:
tpy - tons per year
ppd - pounds per day
/a/ These thresholds would only apply to the portion of project emissions generated within each air district.
SOURCE: Emission rates from the CARB EMFAC2014 model.

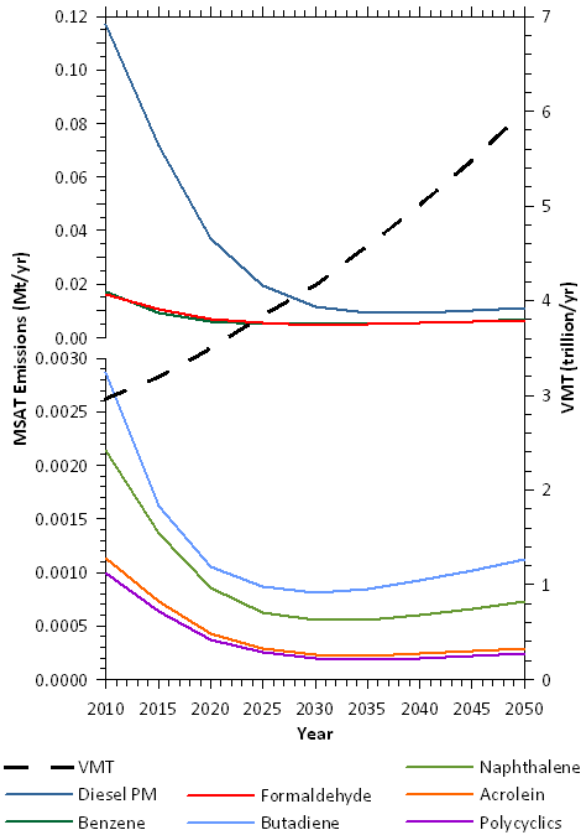


Figure 3-3. National MSAT Emission Trends 1999 – 2050 for Vehicles Operating on Roadways using U.S. EPA's MOVES2010b Model

Mobile Source Air Toxic Research

Air Toxics Analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how potential public health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA.

Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, the public and other agencies expect MSAT impacts to be addressed in environmental documents. The FHWA, U.S. EPA, the Health Effects Institute (HEI), and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

Mobile Source Air Toxic Emissions Analysis Designation

The FHWA, in its Interim Guidance published on December 6, 2012 (Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents), recommends a range of options deemed appropriate for addressing and documenting the MSAT in NEPA documents.

1. No analysis for exempt projects or projects that have no potential for meaningful MSAT effects.

2. Qualitative analysis for projects with low potential MSAT effects.

3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

Exempt Projects or Projects with No Meaningful Potential MSAT Effects

The types of projects included in this category—those that are exempt of have no meaningful potential MSAT effects—are listed below.

- Projects qualifying as a categorical exclusion under 23 CFR 771.117(c).
- Projects exempt under the CAA Conformity Rule under 40 CFR 93.126.
- Other projects with no meaningful impacts on traffic volumes or vehicle mix.

For projects that are categorically excluded under 23 CFR 771.117(c), or are exempt from all conformity requirements under the FCAA pursuant to 40 CFR 93.126, no analysis or discussion of MSAT is necessary. Documentation sufficient to demonstrate that the project qualifies as a categorical exclusion and/or exempt project will suffice. For other projects with no or negligible traffic impacts, regardless of the class of NEPA environmental document, no MSAT analysis is recommended.[12] However, the project record should document the basis for the determination of "no meaningful potential impacts" with a brief description of the factors considered.

Projects with Low Potential MSAT Effects

The types of projects included in this category—projects with low potential MSAT effects—are those that serve to improve operations of highway, transit, or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase MSAT emissions. This category covers a broad range of projects.

FHWA anticipates that most highway projects that need an MSAT assessment will fall into this category. Any projects not meeting the criteria for exempt projects/projects without meaningful potential effects (discussed above) or projects with higher potential MSAT effects (discussed below) should be included in this category. Examples of these types of projects are minor widening projects, new interchanges, replacing a signalized intersection on a surface street, or projects where design year traffic is projected to be less than 140,000 to 150,000 AADT.

For these projects, a qualitative assessment of emissions projections should be conducted. This qualitative assessment would compare, in narrative form, the expected effect of the project on traffic volumes, vehicle mix, or routing of traffic and the associated changes in MSAT for the project alternatives, including the No Build Alternative, based on VMT, vehicle mix, and speed. It would also discuss national trend data projecting substantial overall reductions in emissions due to stricter engine and fuel regulations issued by U.S. EPA. Because the emission effects of these projects typically are low, we expect there would be no appreciable difference in overall MSAT emissions among the various alternatives.

[12]The types of projects categorically excluded under 23 CFR 771.117(d) or exempt from certain conformity requirements under 40 CFR 93.127 does not warrant an automatic exemption from an MSAT analysis, but they usually will have no meaningful impact.

Projects with Higher Potential MSAT Effects

This category includes projects that have the potential for meaningful differences in MSAT emissions among project alternatives. It is expected a limited number of projects would meet the criteria to fall into this category, which are as follows.

- Projects that create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of DPM in a single location, involving a significant number of diesel vehicles for new projects or accommodating with a significant increase in the number of diesel vehicles for expansion projects; or

- Projects that create new capacity or add significant capacity to urban highways, such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the AADT is projected to be in the range of 140,000 to 150,000, or greater, by the design year.

- Projects that are proposed to be located in proximity to populated areas.

Projects falling within this category should be more rigorously assessed for impacts, including a quantitative analysis to forecast local-specific emission trends of the priority MSAT for each alternative. Based on regulations now in effect, an analysis of national trends with EPA's MOVES model, as shown in **Figure 3-3**, even if VMT increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

Mobile Source Air Toxic Emissions in the Project Area

The proposed project is not exempt from an MSAT analysis and the 2040 ADT of 33,030 would be less than the screening guidance of 140,000. Based on the FHWA guidance, the proposed project has low potential for meaningful differences in MSAT emissions among project alternatives (Level 2 Analysis). A qualitative analysis is identified as the appropriate analysis. For each alternative, the amount of MSAT emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the Build Alternatives is slightly higher than that for the No Build Alternative, because the proposed project facilitates new development, attracting trips that would not otherwise occur in the area. This increase in VMT means MSAT under the Build Alternatives would probably be higher than the No Build Alternative in the project area. There could also be localized differences in MSAT from the indirect effects of the project, such as associated access traffic, emissions of evaporative MSAT (e.g., benzene) from parked cars, and emissions of diesel PM from delivery trucks (modified depending on the type and extent of the associated development). Travel to other destinations would be reduced with subsequent decreases in emissions at those locations.

Because the estimated regional VMT under each of the Build Alternatives are nearly the same, increasing by approximately 0.1 percent in 2020 and decreasing by approximately 0.1 in 2040, it is expected there would be no appreciable difference in overall MSAT emissions between the No Build and Alternative and Build Alternatives. In addition, there is a negligible difference in 2020 regional emissions between the full and assignment-only VMT model runs. For all Alternatives, emissions are virtually certain to be lower than present levels in the design year as a result of U.S. EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control

measures. However, the magnitude of the U.S. EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the project area are likely to be lower in the future than they are today.

The travel lanes contemplated as part of the Build Alternatives will have the effect of moving some traffic closer to nearby homes, schools and businesses; therefore, under each Build Alternative there may be localized areas where ambient concentrations of MSAT would be higher under certain Alternatives than others. The localized differences in MSAT concentrations would likely be most pronounced along the new/expanded roadway sections that would be built at the bridge touchdown locations. However, the magnitude and the duration of these potential increases cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. Further, under all Alternatives, overall future MSAT are expected to be substantially lower than today due to implementation of U.S. EPA's vehicle and fuel regulations.

In sum, there would be no appreciable difference in overall MSAT emissions among the various Build Alternatives. There could be increases in MSAT levels in a few localized areas where VMT increases. However, the U.S. EPA's vehicle and fuel regulations will bring about significantly lower MSAT levels for the area in the future than today.

3.2.4 Diesel Particulate Matter

In 1998, California identified diesel PM as a toxic air contaminant based on its potential to cause cancer, premature death, and other health problems. This assessment formed the basis for a decision by CARB to formally identify particles in diesel exhaust as a toxic air contaminant that may pose a threat to human health.

Diesel engines emit a complex mix of pollutants, the most visible of which are very small carbon particles or soot, known as diesel PM. Diesel exhaust also contains more than 40 cancer-causing substances, most of which are readily adsorbed on the soot particles. These include many known or suspected cancer-causing substances, such as benzene, arsenic, and formaldehyde.[13]

Overall, diesel engine emissions are responsible for most of California's estimated cancer risk attributable to air pollution. In addition, diesel PM is a significant fraction of California's particulate pollution problem.

CARB has found that diesel PM contributes more than 70 percent of the known risk from air toxics and poses the greatest cancer risks among all identified air toxics.[14] Diesel trucks contribute more than half of the total diesel combustion sources; however, CARB has adopted a Diesel Risk Reduction Plan with control measures that would reduce the overall diesel PM emissions by approximately 85 percent from 2000 to 2020.[15] In addition, the total toxic risk from diesel exhaust may be exposed for a much shorter duration. Furthermore, diesel PM is only one of many environmental toxics, and those other toxics and other pollutants in various environmental media may overshadow its cancer risks; therefore, while diesel exhaust may pose potential cancer risks to receptors spending time on or near high-risk diesel PM facilities, most receptors' short-term exposure would cause minimal harm, and these risks would also

[13] Air Quality and Diesel Emissions, Environmental Considerations, Office of Freight Planning, California Department of Transportation, website: http://www.dot.ca.gov/hq/tpp/offices/ogm/environment.html, accessed June 11, 2015.

[14] CARB, *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*, October 2000.

[15] *Ibid*.

greatly diminish in the future operating years of the proposed project due to planned emission control regulations.

In addition to diesel PM, ultrafine particles counts are highest near mobile sources, with some of the highest concentrations observed on busy roads. In the urban environment, motor vehicles are a major source of ultrafine particulates. Other recent studies have shown high counts of ultrafine particulates near freeways. While information on health effects of ultrafine particles is limited, various studies suggest that ultrafine particles may have significant health effects that are greater than or independent of the effects due to larger particles that comprise the majority of ambient particulate matter mass.

3.2.5 Construction Emissions (Short-Term Impacts)

General Construction Information

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and various other construction-related activities. Exhaust emissions from construction equipment also are expected and would include CO, NO_X, VOCs, directly-emitted PM (PM_{10} and $PM_{2.5}$), and toxic air contaminants such as diesel PM. Ozone is not directly emitted from construction activities; it is a regional pollutant that is formed from NO_X and VOCs in the presence of sunlight and heat.

Construction of the proposed project is planned to commence in 2018 and is anticipated to be completed in 2020. The duration of construction for the Build Alternatives is approximately 30 months (2.5 years). Construction will occur in four phases due to the scale of the proposed project and the need to minimize traffic impacts and maintain traffic during construction. These four phases include Grubbing/Land Clearing, Grading/Excavation, Drainage/Utilities, and Paving.

The temporary impact analysis described below utilizes the SMAQMD's Roadway Construction Emissions Model (RoadMod) Version 8.1.0, published June 2016 to quantify emissions associated with roadway construction. RoadMod is a data-entry spreadsheet that utilizes various sources to estimate construction emissions, including OFFROAD and EMFAC2014. Construction of the Build Alternatives involves the same general level of activity. Therefore, one model run was used to evaluate construction emissions for all Build Alternatives. The project-specific assumptions used for the construction calculations are summarized as follows:

- A 2018 start date
- A 30-month construction period
- A 0.6-mile corridor length
- A 2.4-acre project area
- A maximum of acres of land disturbed per day
- A maximum of 2.4 acres of land disturbed per day
- Soil import would include a maximum of 1,500 cubic yards per day
- Soil export would include a maximum of 1,000 cubic yards per day
- Water trucks used as control measure for fugitive dust

The above assumptions were used as input parameters to the RoadMod model. RoadMod is specifically developed to estimate emissions associated with roadway construction projects since the default equipment, activities, and typical phasing are different than those of land use development projects and building construction projects. The methodologies and assumptions used in RoadMod are appropriate for road construction projects, including new road construction, road widening and bridge or overpass construction. The RoadMod phasing

assumptions were used to allocate the project specific construction equipment to the specific phases. Calculation methods and assumptions as generated by RoadMod are provided in the Appendix C.

Table 3-8 shows the estimated daily emissions associated with each construction phase. The emissions were estimated using RoadMod Version 8.1.0 and the assumptions listed in the **Appendix A**. When construction information was not available, the analysis relies on RoadMod default assumptions. The construction schedule indicates that maximum emissions would be generated during overlap of Grubbing/Excavation, Drainage/Utilities/Subgrade, Movable Span, and Approach Span. In the project area, the regulation of air quality on the east side of the Sacramento River is under the jurisdiction of the SMAQMD. The regulation of air quality on the west side of the Sacramento River is under the jurisdiction of the YSAQMD. Based on information provided by the project engineers, it was assumed that 50 percent of daily emissions would be generated within each jurisdiction. Daily emissions would vary and typically be less than the maximum emissions presented in the table.

TABLE 3-8: ESTIMATED CONSTRUCTION EMISSIONS

	VOC		NOx		CO	$PM_{2.5}$		PM_{10}	
Emission Source	**tpy**	**ppd**	**tpy**	**ppd**	**tpy**	**tpy**	**ppd**	**tpy**	**ppd**
Grubbing/Land Clearing	0.01	2.0	0.06	21	0.03	0.02	6.2	0.07	26
Grading/Excavation	0.31	5.7	3.6	65	2.2	0.43	7.8	1.5	28
Drainage/Utilities/Subgrade	0.03	1.5	0.32	15	0.29	0.11	5.0	0.46	21
Paving	0.05	1.4	0.44	14	0.38	0.02	0.7	0.02	0.70
Movable Span	0.45	3.4	4.2	31	3.6	0.75	5.7	2.9	22
Approach Span	0.47	6.2	3.7	48	3.3	0.67	8.8	2.5	33
Bridge Demolition	0.08	1.5	0.72	13	0.60	0.49	8.9	2.2	41
Potential Overlapping Emissions (Both Air Quality Districts)	1.3	17	12	159	9.4	2.0	27	7.4	104
Potential Overlapping Emissions (SMAQMD) /a/	**0.64**	**8.4**	**5.9**	**80**	**4.7**	**0.98**	**14**	**3.7**	**52**
Potential Overlapping Emissions (YSAQMD) /a/	**0.64**	**8.4**	**5.9**	**80**	**4.7**	**0.98**	**14**	**3.7**	**52**
SMAQMD CEQA Significance Thresholds	--	--	--	85	--	14.6	82	15	80
YSAQMD CEQA Significance Thresholds	10	--	10	--	--	--	--	--	80
Exceeds threshold?	**No**	--	**No**	**No**	--	**No**	**No**	**No**	**No**

/a/ total emissions for each air district is calculated assuming a 50/50 split of total project emissions between the SMAQMD and YSAQMD.
tpy - tons per year
ppd - pounds per day
SOURCE: Emission rates from the CARB EMFAC and OFFROAD models.

Some phases of construction, particularly asphalt paving, may result in short-term odors in the immediate area of each paving site(s). Such odors would quickly disperse to below detectable levels as distance from the site(s) increases.

Because Caltrans has Statewide jurisdiction and the setting for projects varies so extensively across the State, Caltrans has not and will not develop thresholds of significance for CEQA. Further, because most air district thresholds have not been established by regulation or by delegation from a federal or State agency with regulatory authority over Caltrans, Caltrans is not required to adopt those thresholds in Caltrans' documents. Nevertheless, SMAQMD and YSAQMD thresholds of significance are provided for reference.

Avoidance, Minimization, and Mitigation Measures

To control the generation of construction-related PM_{10} emissions, the project proponent will follow Standard Specification Section 14, "Environmental Stewardship," which addresses the contractor's responsibility on many items of concern, such as: air pollution; protection of lakes, streams, reservoirs, and other water bodies; use of pesticides; safety; sanitation; convenience for the public; and damage or injury to any person or property as a result of any construction operation. Section 14-9.02, which includes specifications relating to air pollution control by complying with air pollution control rules, regulations, ordinances, and statutes that apply to work performed under the contract, including air pollution control rules, regulations, ordinances, and statutes provided in Government Code Section 11017 (Public Contract Code Section 10231). Section 14-9.03 is directed at controlling dust. In addition, Caltrans Standard Specifications for construction (Sections 10 and 18 for dust control and Section 39-3.06 for asphalt concrete plants) will be adhered to in order to reduce emissions generated by construction equipment.

The best available control measures shall be incorporated into the project commitments. With implementation of standard construction measures (providing 50 percent effectiveness) such as frequent watering (e.g., minimum twice per day), fugitive dust and exhaust emissions from construction activities would not result in any adverse air quality impacts with implementation of the project.

Implementation of the following measures would help to reduce construction impacts:

AQ-1 The contractor shall obtain all necessary Sacramento County and Yolo County permits and approvals and shall follow all required County laws and procedures and respect to best management practices, grading and excavation for the proposed project and all construction-related and emission-generating activities.

AQ-2 Construction of the project shall comply with SMAQMD and YSAQMD Basic Construction Emission Control Practices, Exhaust Control Practices, and Fugitive PM Dust Control Practices.

AQ-3 Construction activity within The Railyards Specific Plan area shall comply with the mitigation measures contained in the adopted Mitigation Monitoring and Reporting Plan for The Railyards development (City of Sacramento 2007). Wet suppression and wind speed reduction are the two most common methods used to control open dust sources at construction sites because a source of water and material for wind barriers tend to be readily available on a construction site.

3.2.6 Naturally Occurring Asbestos and Structural Asbestos

Naturally occurring asbestos (NOA) can be released from serpentinite and ultramafic rocks when the rock is broken or crushed. According to the USGS Survey Map for Asbestos in California, there is no occurrence of asbestos reported within a 25-mile vicinity of the project area. Although it is not anticipated that construction activity would encounter NOA, the project

dust control measures would effectively control unanticipated NOA exposure through a variety of required control measures including watering.

Regarding structural asbestos, National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations require an owner or operator of a demolition or renovation project to thoroughly inspect the affected facility or part of the facility where the demolition or renovation operation will occur for the presence of asbestos prior to the commencement of that project. Four viaduct structures being removed as part of the project date to the 1930s and 1950s and have elements that could contain asbestos.[16] Per NESHAP regulations and SMAQMD Rule 902 (Asbestos), the proposed project would be required to develop an Asbestos Compliance Plan. Refer to the hazards analysis in the Draft Environmental Document for a complete discussion on asbestos hazards and related avoidance, minimization, and/or mitigation measures.

3.2.7 Lead

Aerially deposited lead has been found to occur in soils adjacent to highways and high use roadways. The lead is presumably from the historical use of leaded gasoline and subsequent exhaust emissions. There is potential for encountering aerially deposited lead during construction and grading activities within the proposed project limits in West Sacramento along C Street, 2nd Street and at the bridge approach/viaduct leading from C Street.[17] A majority of the area adjacent to C Street is covered sidewalk; therefore, an aerially deposited lead assessment would be limited to areas with exposed soils in that area.

There is potential for encountering aerially deposited lead during construction and grading activities within the proposed project limits in Sacramento at the bridge approach/viaduct leading from I Street. In addition, the bridge landing within the Sacramento City limits is located within an area under evaluation as part of the Sacramento Railyards remediation and is not likely to exhibit concentrations of elevated aerially deposited lead; however, Jibboom Street and Bercut Drive, in various alignments, have been present since 1916 and therefore have the potential to be impacted with aerially deposited lead. Testing indicate that soils from the assessment area would be classified as either non-hazardous or as soil acceptable for management.

The I Street Bridge and its associated approaches are proposed for demolition or modification. Testing identified three locations with paint containing more than 5,000 parts per million lead: silver paint on metal bridge structure, black paint on metal bridge structure, and white paint on metal northeast approach. In addition, the gasket located at the base of the light boxes on the northeast approaches was determined to be pure lead.

The proposed project would be required to develop a Lead Compliance Plan. Refer to the hazards analysis in the Draft Environmental Document for a complete discussion on lead hazards and related avoidance, minimization, and/or mitigation measures.

3.2.8 Climate Change Analysis

Climate change analyses presented in the following sections estimate and analyze the GHG emissions associated with construction and operations of the proposed project.

[16]Blackburn Consulting, *Draft Initial Site Assessment for the I Street Bridge Replacement Project*, July 2015.

[17]*Ibid*.

Operational Emissions

Similar to the regional air quality analysis above, GHG emissions were estimated using emission factors from the CARB EMFAC2014 model. GHG emissions are presented in **Tables 3-9** for 2020 and **3-10** for 2040. Emissions were estimated using CARB's EMFAC2014 model. Currently, there are no Federal or State standards set for CO_2 emissions. The estimated emissions are only useful for a comparison between alternatives. The numbers are not necessarily an accurate reflection of what the true CO_2 emissions would be because CO_2 emissions are dependent on other factors that are not part of the model, such as the fuel mix, rate of acceleration, and the aerodynamics and efficiency of the vehicles. Refer to Appendix D for a summary of limitations and uncertainties associated with the emissions modeling.

TABLE 3-9: ESTIMATED 2020 ANNUAL GHG EMISSIONS

Source	Metric Tons per Year
Existing Conditions	8,808,881
No Build Alternative 2020	9,105,807
Build Alternative 2020	9,108,369
Net Change from 2020 No Build to Alternative	2,562 0.0%
Net Change from Existing Conditions	299,488 3%
Build Alternative 2020 with No Build Trip Distribution	9,102,277
Net Change from 2020 No Build to Alternative	(3,350) 0.0%
Net Change from Existing Conditions	293,396 3%

SOURCE: Emission rates from the CARB EMFAC2014 model.

TABLE 3-10: ESTIMATED 2040 ANNUAL GHG EMISSIONS

Source	Metric Tons Per Year
Existing Conditions	9,204,771
No Build Alternative 2040	8,258,923
Build Alternative 2040	8,258,626
Net Change from 2040 No Build to Alternative	297 0.0%
Net Change from Existing Conditions	(946,145) (6%)

SOURCE: Emission rates from the CARB EMFAC2014 model.

Construction Emissions

Construction GHG emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. Construction GHG emissions are presented in **Table 3-11**. The CEQA baseline emissions for construction are zero. Construction emissions were estimated using RoadMod, which is based on the EMFAC and OFFROAD models. The emissions factors for calculating N_2O and CH_4 emissions were obtained from the 2015 Climate Registry Default Emission Factors Construction and Mining Equipment. Construction of the proposed project would occur for 30 months and a total of 2,470 metric tons of carbon dioxide would be generated, equal to an average of 988 metric tons of carbon dioxide per year.

TABLE 3-11: ESTIMATED GHG EMISSIONS FOR CONSTRUCTION ACTIVITY

Alternative	Carbon Dioxide Equivalent	
	Metric Tons per Year	Total Metric Tons
Bridge Construction	988	2,470

SOURCE: Roadway Construction Emissions Model and project-specific construction information.

GHG emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events.

4.0 REFERENCES

Association of Environmental Professionals, *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents*, March 5, 2007.

Blackburn Consulting, *Draft Initial Site Assessment for the I Street Bridge Replacement Project*, July 2015.

California Environmental Protection Agency, *Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature*, March 2006.

California Air Resource Board (CARB), *2004 Revision to the California State Implementation Plan for Ten Federal Planning Areas*, July 22, 2004.

CARB, *Air Quality Data Statistics* (available at http://www.arb.ca.gov/adam/index.html), accessed June 22, 2015.

CARB, *Ambient Air Quality Standards and Attainment Status*, June 2, 2013.

CARB, *Area Designation Maps*, June 24, 2015.

CARB, *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*, Stationary Source Division, Mobile Source Control Division, October 2000.

California Climate Change Center, Our Changing Climate: Assessing the Risks to California, July 2006.

California Department of Transportation (Caltrans), *Climate Action Program at Caltrans*, December 2006.

Caltrans, *Transportation Project-Level Carbon Monoxide Protocol*, December 1997.

City of Sacramento, *Sacramento City Council Resolution 2007-903. Exhibit B. Mitigation Monitoring and Reporting Plan*, Adopted December 11, 2007.

Congressional Research Service, *Clean Air Act: A Summary of the Act and Its Major Requirements*, January, 2011.Constantinos Sioutas, et al., *Exposure Assessment for Atmospheric Ultrafine Particles (UFPs) and Implications in Epidemiologic Research*, Environmental Health Perspectives, Volume 113, Number 8, August 2005.

Federal Highway Administration, *Memorandum: Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA*, December 6, 2012.

Institute of Transportation Studies-University of California Davis, *Project-Level Carbon Monoxide Protocol (UCD-ITS-RR-97-21)*, December 1997.

Sacramento Area Council of Governments (SACOG), *Conformity Analysis for the 2015/18 Metropolitan Transportation Improvement Program and Amendment #4 to the Metropolitan Transportation Plan and Sustainable Communities Strategy 2035*, adopted September 2014.

Sacramento Metropolitan Air Quality Management District (SMAQMD), *CEQA Guide to Air Quality Assessment*, revised November 2014.

U.S. Environmental Protection Agency (EPA), *Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act*, September 15, 2009.

U.S. EPA, *The Green Book Nonattainment Areas for Criteria Pollutants*, June 24, 2015.

U.S. EPA, *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas*, November 2013.

United States Forest Service, *Climate Change Considerations in Project Level NEPA Analysis*, July 13, 2009.

United States Geological Survey, Van Gosen, B.S., and Clinkenbeard, J.P, Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California - California Geological Survey Map Sheet 59, August 22, 2011.

Western Regional Climate Center, *Historical Climate Information* (available at http://www.wrrc.dri.edu), accessed January 13, 2015.

Yolo-Solano Air Quality Management District (YSAQMD), *Handbook for Assessing and Mitigating Air Quality Impacts*, July 11, 2007.

APPENDICES

Appendix A

Intersection LOS Data

I Street Bridge Replacement
Study Locations

			Existing Conditions					
			AM			PM		
ID_L	Street 1	Street 2	Demand Served %	Delay	LOS	Demand Served %	Delay	LOS
1	Jefferson Blvd	Sacramento Ave	100.0%	25.2	C	100.0%	30.5	C
2	5th St	C St	100.0%	17.6	B	98.7%	19.5	B
3	3rd St	C St	100.0%	10.3	B	98.1%	15.3	B
4	5th St	E St	99.6%	7.7	A	100.0%	7.3	A
5	3rd St	E St	100.0%	7.1	A	98.4%	6.3	A
6	5th St	F St	100.0%	8.8	A	100.0%	9.5	A
7	3rd St	F St	100.0%	9.6	A	99.7%	8.1	A
8	5th St	West Capitol Ave	100.0%	33.2	C	99.6%	33.2	C
9	5th St	Tower Bridge Gateway	100.0%	33.8	C	99.4%	44.6	D
10	3rd St	Tower Bridge Gateway	100.0%	14.7	B	99.8%	16.0	B
11	Jibboom St	Richards Blvd	100.0%	19.1	C	100.00%	14.7	B
12	I-5 SB Ramps	Richards Blvd	99.8%	19.2	B	100.00%	20.1	C
13	I-5 NB Ramps	Richards Blvd	100.0%	13.6	B	99.20%	14.8	B
14	Bercut Dr	Richards Blvd	100.0%	11.7	B	99.40%	21.1	C
15	N 3rd St	Richards Blvd	100.0%	18.1	B	98.90%	31.9	C
16	N 7th St	Richards Blvd	99.5%	25.3	C	100.00%	19.7	B
17	N 12th St	Richards Blvd	99.2%	32.0	C	99.20%	37.6	D
18	N 7th St	N B St	100.0%	14.0	B	100.00%	16.5	B
19	N 12th St	N B St	100.0%	14.8	B	100.00%	17.1	B
20	N 7th St	F St	100.0%	9.4	A	99.70%	8.5	A
21	8th St	F St	100.0%	5.7	A	99.70%	5.8	A
22	N 7th St	G St	100.0%	8.1	A	100.00%	6.7	A
23	Jibboom St	I Street Bridge	100.0%	23.2	C	94.40%	96.9	F
24	5th St	H St	100.0%	9.0	A	97.40%	6.7	A
25	6th St	H St	100.0%	9.1	A	99.30%	7.7	A
26	N 7th St	H St	100.0%	10.2	B	100.00%	10.6	B
27	8th St	H St	100.0%	8.4	A	98.10%	8.2	A
28	3rd St	J St	98.1%	63.8	E	85.50%	93.9	F
29	5th St	I St	100.0%	6.0	A	98.30%	16.8	B
30	6th St	I St	100.0%	11.8	B	98.50%	23.2	C
31	7th St	I St	100.0%	8.6	A	99.10%	37.8	D
32	3rd St	Capitol Mall	99.3%	23.8	C	95.70%	20.8	C
33	Jibboom St	Railyards Blvd	-	-	-	-	-	-
34	Bercut Dr	Railyards Blvd	-	-	-	-	-	-
35	N 5th St	Railyards Blvd	-	-	-	-	-	-
36	N 7th St	Railyards Blvd	-	-	-	-	-	-
37	N 12th St	Railyards Blvd	-	-	-	-	-	-

I Street Bridge Replacement
Study Locations

				2020 No Build					
				AM			PM		
ID_L	Street 1	Street 2		Demand Served %	Delay	LOS	Demand Served %	Delay	LOS
1	Jefferson Blvd	Sacramento Ave	1	99.2%	28.4	C	99.4%	46.9	D
2	5th St	C St	2	97.8%	21.7	C	83.1%	70.5	E
3	3rd St	C St	3	95.2%	13.4	B	82.6%	37.1	D
4	5th St	E St	4	99.3%	12.3	B	100.0%	14.5	B
5	3rd St	E St	5	100.0%	10.9	B	99.4%	10.7	B
6	5th St	F St	6	99.5%	13.6	B	100.0%	15.9	C
7	3rd St	F St	7	100.0%	11.8	B	99.1%	10.1	B
8	5th St	West Capitol Ave	8	76.3%	71.0	E	79.6%	57.8	E
9	5th St	Tower Bridge Gateway	9	91.2%	78.1	E	90.5%	68.0	E
10	3rd St	Tower Bridge Gateway	10	97.9%	26.4	C	92.9%	61.7	E
11	Jibboom St	Richards Blvd	11	96.1%	13.2	B	87.30%	68.3	F
12	I-5 SB Ramps	Richards Blvd	12	94.0%	57.2	E	82.00%	27.7	C
13	I-5 NB Ramps	Richards Blvd	13	96.9%	17.1	B	76.20%	17.0	B
14	Bercut Dr	Richards Blvd	14	97.2%	13.2	B	75.00%	47.2	D
15	N 3rd St	Richards Blvd	15	97.9%	16.8	B	65.50%	126.2	F
16	N 7th St	Richards Blvd	16	96.9%	115.6	F	90.50%	141.8	F
17	N 12th St	Richards Blvd	17	84.1%	85.2	F	92.30%	87.9	F
18	N 7th St	N B St	18	90.7%	126.5	F	76.20%	88.0	F
19	N 12th St	N B St	19	100.0%	91.7	F	100.00%	40.1	D
20	N 7th St	F St	20	100.0%	14.3	B	100.00%	11.9	B
21	8th St	F St	21	100.0%	7.9	A	100.00%	7.2	A
22	N 7th St	G St	22	100.0%	7.2	A	99.00%	7.1	A
23	Jibboom St	I Street Bridge	23	93.2%	89.6	F	79.00%	114.0	F
24	5th St	H St	24	98.9%	10.3	B	82.80%	12.5	B
25	6th St	H St	25	93.7%	35.5	D	71.40%	8.6	A
26	N 7th St	H St	26	98.8%	14.5	B	91.40%	10.2	B
27	8th St	H St	27	99.4%	8.8	A	90.90%	8.9	A
28	3rd St	J St	28	78.5%	109.4	F	71.90%	100.1	F
29	5th St	I St	29	97.9%	9.6	A	82.80%	34.9	C
30	6th St	I St	30	94.1%	46.0	D	80.60%	49.3	D
31	7th St	I St	31	99.1%	18.8	B	91.10%	38.6	D
32	3rd St	Capitol Mall	32	88.4%	26.2	C	88.60%	27.3	C
33	Jibboom St	Railyards Blvd	33	-	-	-	-	-	-
34	Bercut Dr	Railyards Blvd	34	-	-	-	-	-	-
35	N 5th St	Railyards Blvd	35	100.0%	18.2	B	97.0%	18.6	B
36	N 7th St	Railyards Blvd	36	99.9%	21.7	C	92.5%	69.5	E
37	N 12th St	Railyards Blvd	37	-	-	-	-	-	-

I Street Bridge Replacement
Study Locations

				2020 Alternative 1					
				AM			PM		
ID_L	Street 1	Street 2		Demand Served %	Delay	LOS	Demand Served %	Delay	LOS
1	Jefferson Blvd	Sacramento Ave	1	99.5%	26.7	C	100.0%	36.8	D
2	5th St	C St	2	98.0%	41.3	D	98.0%	35.4	D
3	3rd St	C St	3	98.4%	28.8	C	98.6%	23.6	C
4	5th St	E St	4	100.0%	22.9	C	99.9%	38.5	E
5	3rd St	E St	5	100.0%	13.2	B	100.0%	11.5	B
6	5th St	F St	6	100.0%	34.5	D	99.7%	37.9	E
7	3rd St	F St	7	100.0%	12.5	B	100.0%	11.3	B
8	5th St	West Capitol Ave	8	71.7%	51.7	D	74.5%	50.0	D
9	5th St	Tower Bridge Gateway	9	82.5%	89.0	F	84.5%	79.0	E
10	3rd St	Tower Bridge Gateway	10	91.7%	23.1	C	88.8%	69.9	E
11	Jibboom St	Richards Blvd	11	95.3%	10.7	B	100.00%	13.7	B
12	I-5 SB Ramps	Richards Blvd	12	93.2%	35.2	D	87.60%	23.5	C
13	I-5 NB Ramps	Richards Blvd	13	90.9%	29.7	C	79.60%	15.0	B
14	Bercut Dr	Richards Blvd	14	88.4%	44.4	D	79.00%	53.1	D
15	N 3rd St	Richards Blvd	15	83.0%	69.4	E	70.80%	125.3	F
16	N 7th St	Richards Blvd	16	96.8%	111.2	F	89.90%	145.7	F
17	N 12th St	Richards Blvd	17	83.7%	86.9	F	93.00%	86.3	F
18	N 7th St	N B St	18	88.3%	148.0	F	75.30%	77.3	E
19	N 12th St	N B St	19	97.1%	84.7	F	100.00%	42.2	D
20	N 7th St	F St	20	99.6%	13.8	B	100.00%	12.7	B
21	8th St	F St	21	99.2%	7.5	A	100.00%	7.2	A
22	N 7th St	G St	22	99.9%	7.5	A	99.50%	6.8	A
23	Jibboom St	I Street Bridge	23	-	-	-	-	-	-
24	5th St	H St	24	99.9%	9.5	A	94.20%	14.6	B
25	6th St	H St	25	100.0%	11.8	B	84.30%	12.2	B
26	N 7th St	H St	26	100.0%	12.6	B	97.20%	9.3	A
27	8th St	H St	27	100.0%	9.4	A	98.50%	8.6	A
28	3rd St	J St	28	82.7%	93.9	F	81.60%	93.2	F
29	5th St	I St	29	99.7%	7.6	A	91.40%	26.9	C
30	6th St	I St	30	99.5%	18.2	B	87.60%	45.9	D
31	7th St	I St	31	99.2%	17.4	B	94.30%	36.8	D
32	3rd St	Capitol Mall	32	90.8%	26.9	C	88.80%	39.2	D
33	Jibboom St	Railyards Blvd	33	98.5%	10.7	B	98.2%	16.7	B
34	Bercut Dr	Railyards Blvd	34	98.1%	18.1	B	97.5%	34.2	C
35	N 5th St	Railyards Blvd	35	98.7%	14.4	B	97.4%	11.1	B
36	N 7th St	Railyards Blvd	36	98.9%	30.1	C	94.7%	70.9	E
37	N 12th St	Railyards Blvd	37	-	-	-	-	-	-

I Street Bridge Replacement
Study Locations

				2020 Alternative 2					
				AM			PM		
ID_L	Street 1	Street 2		Demand Served %	Delay	LOS	Demand Served %	Delay	LOS
1	Jefferson Blvd	Sacramento Ave	1	99.5%	26.7	C	100.0%	36.8	D
2	5th St	C St	2	99.4%	45.8	D	92.3%	31.4	C
3	3rd St	C St	3	100.0%	36.0	D	90.5%	14.9	B
4	5th St	E St	4	100.0%	22.9	C	99.9%	38.5	E
5	3rd St	E St	5	100.0%	13.2	B	100.0%	11.5	B
6	5th St	F St	6	100.0%	34.5	D	99.7%	37.9	E
7	3rd St	F St	7	100.0%	12.5	B	100.0%	11.3	B
8	5th St	West Capitol Ave	8	71.7%	51.7	D	74.5%	50.0	D
9	5th St	Tower Bridge Gateway	9	82.5%	89.0	F	84.5%	79.0	E
10	3rd St	Tower Bridge Gateway	10	91.7%	23.1	C	88.8%	69.9	E
11	Jibboom St	Richards Blvd	11	95.3%	10.7	B	100.00%	13.7	B
12	I-5 SB Ramps	Richards Blvd	12	93.2%	35.2	D	87.60%	23.5	C
13	I-5 NB Ramps	Richards Blvd	13	90.9%	29.7	C	79.60%	15.0	B
14	Bercut Dr	Richards Blvd	14	88.4%	44.4	D	79.00%	53.1	D
15	N 3rd St	Richards Blvd	15	83.0%	69.4	E	70.80%	125.3	F
16	N 7th St	Richards Blvd	16	96.8%	111.2	F	89.90%	145.7	F
17	N 12th St	Richards Blvd	17	83.7%	86.9	F	93.00%	86.3	F
18	N 7th St	N B St	18	88.3%	148.0	F	75.30%	77.3	E
19	N 12th St	N B St	19	97.1%	84.7	F	100.00%	42.2	D
20	N 7th St	F St	20	99.6%	13.8	B	100.00%	12.7	B
21	8th St	F St	21	99.2%	7.5	A	100.00%	7.2	A
22	N 7th St	G St	22	99.9%	7.5	A	99.50%	6.8	A
23	Jibboom St	I Street Bridge	23	-	-	-	-	-	-
24	5th St	H St	24	99.9%	9.5	A	94.20%	14.6	B
25	6th St	H St	25	100.0%	11.8	B	84.30%	12.2	B
26	N 7th St	H St	26	100.0%	12.6	B	97.20%	9.3	A
27	8th St	H St	27	100.0%	9.4	A	98.50%	8.6	A
28	3rd St	J St	28	82.7%	93.9	F	81.60%	93.2	F
29	5th St	I St	29	99.7%	7.6	A	91.40%	26.9	C
30	6th St	I St	30	99.5%	18.2	B	87.60%	45.9	D
31	7th St	I St	31	99.2%	17.4	B	94.30%	36.8	D
32	3rd St	Capitol Mall	32	90.8%	26.9	C	88.80%	39.2	D
33	Jibboom St	Railyards Blvd	33	100.0%	14.1	B	88.2%	22.9	C
34	Bercut Dr	Railyards Blvd	34	100.0%	5.6	A	85.6%	136.5	F
35	N 5th St	Railyards Blvd	35	90.9%	11.3	B	95.2%	16.4	B
36	N 7th St	Railyards Blvd	36	96.6%	30.1	C	96.2%	70.3	E
37	N 12th St	Railyards Blvd	37	-	-	-	-	-	-

I Street Bridge Replacement
Study Locations

				2040 No Build					
				AM			PM		
ID_L	Street 1	Street 2		Demand Served %	Delay	LOS	Demand Served %	Delay	LOS
1	Jefferson Blvd	Sacramento Ave	1	94.6%	82.4	F	89.5%	95.3	F
2	5th St	C St	2	67.6%	110.6	F	61.5%	142.7	F
3	3rd St	C St	3	69.8%	101.4	F	65.8%	94.6	F
4	5th St	E St	4	99.4%	26.6	D	100.0%	25.9	D
5	3rd St	E St	5	100.0%	15.3	B	100.0%	16.5	B
6	5th St	F St	6	99.2%	28.8	D	98.8%	46.2	E
7	3rd St	F St	7	100.0%	15.3	B	100.0%	16.0	B
8	5th St	West Capitol Ave	8	-	-	-	-	-	-
9	5th St	Tower Bridge Gateway	9	98.6%	35.5	D	97.1%	34.0	C
10	3rd St	Tower Bridge Gateway	10	100.0%	31.7	C	100.0%	32.2	C
11	Jibboom St	Richards Blvd	11	73.0%	11.9	B	88.60%	90.1	F
12	I-5 SB Ramps	Richards Blvd	12	71.2%	80.9	F	85.70%	57.9	E
13	I-5 NB Ramps	Richards Blvd	13	84.8%	35.1	D	78.80%	14.1	B
14	Bercut Dr	Richards Blvd	14	85.3%	40.6	D	78.20%	64.9	E
15	N 3rd St	Richards Blvd	15	87.6%	22.6	C	69.20%	138.6	F
16	N 7th St	Richards Blvd	16	99.1%	64.1	E	100.50%	36.3	D
17	N 12th St	Richards Blvd	17	81.1%	149.3	F	96.10%	101.2	F
18	N 7th St	N B St	18	89.2%	125.5	F	81.80%	118.5	F
19	N 12th St	N B St	19	57.1%	222.0	F	54.50%	235.4	F
20	N 7th St	F St	20	95.7%	19.7	B	100.00%	13.2	B
21	8th St	F St	21	97.8%	9.3	A	96.50%	7.6	A
22	N 7th St	G St	22	94.9%	9.5	A	93.10%	9.6	A
23	Jibboom St	I Street Bridge	23	68.5%	119.4	F	64.40%	119.3	F
24	5th St	H St	24	78.3%	43.5	D	78.20%	49.5	D
25	6th St	H St	25	81.6%	57.2	E	72.10%	55.6	E
26	N 7th St	H St	26	89.2%	44.0	D	84.90%	29.2	C
27	8th St	H St	27	91.4%	44.2	D	82.70%	68.2	E
28	3rd St	J St	28	74.5%	96.3	F	69.00%	98.9	F
29	5th St	I St	29	79.8%	49.5	D	75.70%	48.6	D
30	6th St	I St	30	93.0%	31.3	C	76.40%	61.4	E
31	7th St	I St	31	98.3%	14.9	B	83.00%	44.7	D
32	3rd St	Capitol Mall	32	88.8%	25.7	C	85.30%	39.2	D
33	Jibboom St	Railyards Blvd	33	69.9%	102.3	F	61.7%	81.0	F
34	Bercut Dr	Railyards Blvd	34	73.6%	200.0	F	57.8%	310.1	F
35	N 5th St	Railyards Blvd	35	83.2%	68.3	E	60.9%	154.6	F
36	N 7th St	Railyards Blvd	36	93.1%	40.5	D	76.9%	126.9	F
37	N 12th St	Railyards Blvd	37	58.5%	7.4	A	66.0%	7.2	A

I Street Bridge Replacement
Study Locations

				2040 Alternative 1					
				AM			PM		
ID_L	Street 1	Street 2		Demand Served %	Delay	LOS	Demand Served %	Delay	LOS
1	Jefferson Blvd	Sacramento Ave	1	93.1%	84.8	F	88.6%	95.2	F
2	5th St	C St	2	93.3%	44.7	D	91.4%	30.9	C
3	3rd St	C St	3	90.0%	47.7	D	87.4%	32.9	C
4	5th St	E St	4	100.0%	37.0	E	100.8%	71.9	F
5	3rd St	E St	5	100.0%	21.0	C	100.3%	21.5	C
6	5th St	F St	6	100.0%	71.6	F	100.3%	78.6	F
7	3rd St	F St	7	100.0%	17.1	B	101.4%	19.6	B
8	5th St	West Capitol Ave	8	-	-	-	-	-	-
9	5th St	Tower Bridge Gateway	9	96.0%	36.4	D	97.4%	33.8	C
10	3rd St	Tower Bridge Gateway	10	100.0%	33.1	C	101.0%	34.3	C
11	Jibboom St	Richards Blvd	11	80.2%	9.7	A	98.70%	9.2	A
12	I-5 SB Ramps	Richards Blvd	12	74.1%	67.2	E	87.60%	30.9	C
13	I-5 NB Ramps	Richards Blvd	13	85.2%	20.9	C	78.30%	16.9	B
14	Bercut Dr	Richards Blvd	14	85.7%	32.9	C	77.30%	82.9	F
15	N 3rd St	Richards Blvd	15	86.7%	16.4	B	69.80%	145.4	F
16	N 7th St	Richards Blvd	16	99.9%	46.2	D	99.90%	42.8	D
17	N 12th St	Richards Blvd	17	81.7%	154.8	F	93.20%	117.1	F
18	N 7th St	N B St	18	90.2%	119.6	F	82.20%	110.4	F
19	N 12th St	N B St	19	55.9%	237.4	F	48.80%	273.8	F
20	N 7th St	F St	20	96.5%	20.6	C	94.70%	20.2	C
21	8th St	F St	21	98.2%	8.8	A	94.70%	8.1	A
22	N 7th St	G St	22	94.4%	12.6	B	92.10%	16.0	B
23	Jibboom St	I Street Bridge	23	-	-	-	-	-	-
24	5th St	H St	24	83.6%	35.3	D	71.90%	60.6	E
25	6th St	H St	25	84.8%	48.6	D	75.40%	57.5	E
26	N 7th St	H St	26	90.9%	35.2	D	84.80%	30.5	C
27	8th St	H St	27	95.3%	20.0	B	81.60%	67.9	E
28	3rd St	J St	28	80.9%	88.0	F	79.60%	77.8	E
29	5th St	I St	29	82.9%	52.2	D	72.70%	50.7	D
30	6th St	I St	30	93.8%	31.2	C	76.00%	66.4	E
31	7th St	I St	31	99.2%	14.7	B	80.80%	51.2	D
32	3rd St	Capitol Mall	32	91.7%	24.8	C	88.30%	34.5	C
33	Jibboom St	Railyards Blvd	33	89.4%	46.3	D	87.0%	20.1	C
34	Bercut Dr	Railyards Blvd	34	89.7%	129.3	F	85.9%	140.8	F
35	N 5th St	Railyards Blvd	35	93.7%	54.9	D	83.4%	80.5	F
36	N 7th St	Railyards Blvd	36	97.7%	27.0	C	91.5%	70.3	E
37	N 12th St	Railyards Blvd	37	57.2%	7.1	A	60.1%	9.7	A

I Street Bridge Replacement
Study Locations

				2040 Alternative 2					
				AM			PM		
ID_L	Street 1	Street 2		Demand Served %	Delay	LOS	Demand Served %	Delay	LOS
1	Jefferson Blvd	Sacramento Ave	1	93.1%	84.8	F	88.6%	95.2	F
2	5th St	C St	2	96.1%	33.8	C	92.2%	30.0	C
3	3rd St	C St	3	94.8%	30.6	C	89.8%	25.6	C
4	5th St	E St	4	100.0%	37.0	E	100.8%	71.9	F
5	3rd St	E St	5	100.0%	21.0	C	100.3%	21.5	C
6	5th St	F St	6	100.0%	71.6	F	100.3%	78.6	F
7	3rd St	F St	7	100.0%	17.1	B	101.4%	19.6	B
8	5th St	West Capitol Ave	8	-	-	-	-	-	-
9	5th St	Tower Bridge Gateway	9	96.0%	36.4	D	97.4%	33.8	C
10	3rd St	Tower Bridge Gateway	10	100.0%	33.1	C	101.0%	34.3	C
11	Jibboom St	Richards Blvd	11	80.2%	9.7	A	98.70%	9.2	A
12	I-5 SB Ramps	Richards Blvd	12	74.1%	67.2	E	87.60%	30.9	C
13	I-5 NB Ramps	Richards Blvd	13	85.2%	20.9	C	78.30%	16.9	B
14	Bercut Dr	Richards Blvd	14	85.7%	32.9	C	77.30%	82.9	F
15	N 3rd St	Richards Blvd	15	86.7%	16.4	B	69.80%	145.4	F
16	N 7th St	Richards Blvd	16	99.9%	46.2	D	99.90%	42.8	D
17	N 12th St	Richards Blvd	17	81.7%	154.8	F	93.20%	117.1	F
18	N 7th St	N B St	18	90.2%	119.6	F	82.20%	110.4	F
19	N 12th St	N B St	19	55.9%	237.4	F	48.80%	273.8	F
20	N 7th St	F St	20	96.5%	20.6	C	94.70%	20.2	C
21	8th St	F St	21	98.2%	8.8	A	94.70%	8.1	A
22	N 7th St	G St	22	94.4%	12.6	B	92.10%	16.0	B
23	Jibboom St	I Street Bridge	23	-	-	-	-	-	-
24	5th St	H St	24	83.6%	35.3	D	71.90%	60.6	E
25	6th St	H St	25	84.8%	48.6	D	75.40%	57.5	E
26	N 7th St	H St	26	90.9%	35.2	D	84.80%	30.5	C
27	8th St	H St	27	95.3%	20.0	B	81.60%	67.9	E
28	3rd St	J St	28	80.9%	88.0	F	79.60%	77.8	E
29	5th St	I St	29	82.9%	52.2	D	72.70%	50.7	D
30	6th St	I St	30	93.8%	31.2	C	76.00%	66.4	E
31	7th St	I St	31	99.2%	14.7	B	80.80%	51.2	D
32	3rd St	Capitol Mall	32	91.7%	24.8	C	88.30%	34.5	C
33	Jibboom St	Railyards Blvd	33	95.8%	24.7	C	89.8%	7.6	A
34	Bercut Dr	Railyards Blvd	34	95.1%	65.5	F	88.9%	115.4	F
35	N 5th St	Railyards Blvd	35	96.8%	40.1	D	86.0%	94.5	F
36	N 7th St	Railyards Blvd	36	99.4%	25.6	C	86.7%	95.5	F
37	N 12th St	Railyards Blvd	37	57.2%	7.1	A	60.1%	9.7	A

Appendix B

Incomplete or Unavailable Information

for Project Specific

Mobile Air Toxic Health Impact Analysis

Incomplete or Unavailable Information for Project-Specific Mobile Source Air Toxic Health Impact Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the FCAA and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSATs. The U.S. EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects." Each report contains assessments of noncancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSATs, including the HEI. Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts, with each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology, which affects emissions rates, over that time frame because such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSATs because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, which is a concern expressed by HEI. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds and, in particular, for diesel particulate matter. The U.S. EPA and HEI have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also a lack of national consensus on an acceptable level of risk. The current context is the process used by U.S. EPA as provided by the FCAA to determine whether more stringent controls are required to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect

for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires the U.S. EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; and in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld U.S. EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities, plus improved access for emergency response, that are better suited for quantitative analysis.

Appendix C

Road Construction Emission Model (RoadMod)

Assumptions and Results

The maximum pounds per day in row 11 is summed over overlapping phases, but the maximum tons per phase in row 34 is not summed over overlapping phases.

Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> I-Street Bridge Construction - Phases 1 to 4

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	2.04	9.35	21.13	26.10	1.10	25.00	6.20	1.00	5.20	0.02	1,585.26	0.47	0.02	1,601.46
Grading/Excavation	5.70	39.53	65.25	28.01	3.01	25.00	7.84	2.64	5.20	0.10	9,890.30	2.04	0.16	9,989.82
Drainage/Utilities/Sub-Grade	1.52	13.40	14.49	20.88	0.88	20.00	4.95	0.79	4.16	0.02	2,180.95	0.58	0.02	2,202.79
Paving	1.42	11.38	13.46	0.75	0.75	0.00	0.68	0.68	0.00	0.02	1,737.31	0.50	0.02	1,754.69
Maximum (pounds/day)	7.23	52.93	79.74	48.89	3.89	45.00	12.79	3.43	9.36	0.12	12,071.25	2.62	0.19	12,192.61
Total (tons/construction project)	0.40	2.87	4.41	2.10	0.21	1.88	0.58	0.19	0.39	0.01	653.64	0.14	0.01	660.21

Notes:

Project Start Year ->	2018
Project Length (months) ->	10
Total Project Area (acres) ->	2
Maximum Area Disturbed/Day (acres) ->	2
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	56	10
Grading/Excavation	2,500	0	780	0	420	80
Drainage/Utilities/Sub-Grade	0	0	0	0	210	40
Paving	0	0	0	0	210	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> I-Street Bridge Construction - Phases 1 to 4

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.01	0.03	0.06	0.07	0.00	0.07	0.02	0.00	0.01	0.00	4.36	0.00	0.00	4.00
Grading/Excavation	0.31	2.17	3.59	1.54	0.17	1.38	0.43	0.15	0.29	0.01	543.97	0.11	0.01	498.45
Drainage/Utilities/Sub-Grade	0.03	0.29	0.32	0.46	0.02	0.44	0.11	0.02	0.09	0.00	47.98	0.01	0.00	43.96
Paving	0.05	0.38	0.44	0.02	0.02	0.00	0.02	0.02	0.00	0.00	57.33	0.02	0.00	52.53
Maximum (tons/phase)	0.31	2.17	3.59	1.54	0.17	1.38	0.43	0.15	0.29	0.01	543.97	0.11	0.01	498.45
Total (tons/construction project)	0.40	2.87	4.41	2.10	0.21	1.88	0.58	0.19	0.39	0.01	653.64	0.14	0.01	598.94

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

The maximum pounds per day in row 11 is summed over overlapping phases, but the maximum tons per phase in row 34 is not summed over overlapping phases.

Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> I-Street Bridge Construction - Phases 5 to 7

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	3.43	27.65	31.44	21.63	1.63	20.00	5.71	1.55	4.16	0.07	6,396.23	1.24	0.06	6,444.19
Grading/Excavation	6.17	42.23	47.78	32.62	2.62	30.00	8.76	2.52	6.24	0.09	8,184.83	1.74	0.07	8,249.51
Drainage/Utilities/Sub-Grade	1.50	10.93	13.06	40.62	0.62	40.00	8.92	0.60	8.32	0.03	2,738.43	0.59	0.02	2,760.31
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (pounds/day)	9.59	69.88	79.22	54.25	4.25	50.00	14.47	4.07	10.40	0.15	14,581.06	2.97	0.13	14,693.70
Total (tons/construction project)	1.24	9.33	10.62	9.03	0.56	8.47	2.30	0.53	1.76	0.02	2,047.30	0.41	0.02	2,062.98

Notes:

Project Start Year ->	2018
Project Length (months) ->	20
Total Project Area (acres) ->	2
Maximum Area Disturbed/Day (acres) ->	2
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	560	0
Grading/Excavation	0	0	0	0	350	0
Drainage/Utilities/Sub-Grade	0	0	0	0	112	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> I-Street Bridge Construction - Phases 5 to 7

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.68	5.47	6.23	4.28	0.32	3.96	1.13	0.31	0.82	0.01	1,266.45	0.24	0.01	1,157.53
Grading/Excavation	0.47	3.25	3.68	2.51	0.20	2.31	0.67	0.19	0.48	0.01	630.23	0.13	0.01	576.26
Drainage/Utilities/Sub-Grade	0.08	0.60	0.72	2.23	0.03	2.20	0.49	0.03	0.46	0.00	150.61	0.03	0.00	137.73
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (tons/phase)	0.68	5.47	6.23	4.28	0.32	3.96	1.13	0.31	0.82	0.01	1266.45	0.24	0.01	1,157.53
Total (tons/construction project)	1.24	9.33	10.62	9.03	0.56	8.47	2.30	0.53	1.76	0.02	2047.30	0.41	0.02	1,871.52

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model
Data Entry Worksheet

Version 8.1.0

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	I-Street Bridge Construction - Phases 1 to 4	
Construction Start Year	2018	Enter a Year between 2014 and 2025 (inclusive)
Project Type	3	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	10.25	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	0.61	miles
Total Project Area	2.43	acres
Maximum Area Disturbed/Day	2.43	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing		0.00	0.00
	Grading/Excavation	12.00	1500.00	1000.00
	Drainage/Utilities/Sub-Grade		0.00	0.00
	Paving		0.00	0.00
Asphalt	Grubbing/Land Clearing		0.00	0.00
	Grading/Excavation		0.00	0.00
	Drainage/Utilities/Sub-Grade		0.00	0.00
	Paving		0.00	0.00

Mitigation Options

On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation		Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/ceqa/mitigation.shtml). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.25	1.03	5/1/2018	1/1/2018
Grading/Excavation	5.00	4.10	6/1/2018	1/9/2018
Drainage/Utilities/Sub-Grade	2.00	3.59	10/1/2018	6/11/2018
Paving	3.00	1.54	11/1/2019	8/11/2018
Totals (Months)	10			

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing	0.00	30.00		0	0.00
Miles/round trip: Grading/Excavation	30.00	30.00	26	209	780.00
Miles/round trip: Drainage/Utilities/Sub-Grade	0.00	30.00		0	0.00
Miles/round trip: Paving	0.00	30.00		0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Grading/Excavation (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Paving (grams/mile)	0.07	0.36	1.47	0.10	0.04	0.02	1,574.91	0.00	0.05	1,590.43
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.11	0.62	2.59	0.18	0.07	0.03	2,734.63	0.01	0.09	2,761.57
Tons per const. Period - Grading/Excavation	0.01	0.03	0.14	0.01	0.00	0.00	150.40	0.00	0.00	151.89
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.01	0.03	0.14	0.01	0.00	0.00	150.40	0.00	0.00	151.89

Note: Asphalt Hauling emission default values can be overridden in cells D87 through D90, and F87 through F90.

Asphalt Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing		30.00		0	0.00
Miles/round trip: Grading/Excavation		30.00		0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade		30.00		0	0.00
Miles/round trip: Paving		30.00		0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Grading/Excavation (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Paving (grams/mile)	0.07	0.36	1.47	0.10	0.04	0.02	1,574.91	0.00	0.05	1,590.43
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D113 through D118.

Worker Commute Emissions User Input	User Override of Worker Commute Default Values	Default Values	Calculated Daily Trips	Calculated Daily VMT
Miles/ one-way trip	7	20		
One-way trips/day	2	2		
No. of employees: Grubbing/Land Clearing	4	7	8	56.00
No. of employees: Grading/Excavation	30	29	60	420.00
No. of employees: Drainage/Utilities/Sub-Grade	15	19	30	210.00
No. of employees: Paving	15	9	30	210.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91
Grading/Excavation (grams/mile)	0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91
Draining/Utilities/Sub-Grade (grams/mile)	0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91
Paving (grams/mile)	0.02	1.15	0.12	0.05	0.02	0.00	378.20	0.01	0.01	379.95
Grubbing/Land Clearing (grams/trip)	1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49
Grading/Excavation (grams/trip)	1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49
Draining/Utilities/Sub-Grade (grams/trip)	1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49
Paving (grams/trip)	1.05	2.75	0.22	0.00	0.00	0.00	85.31	0.01	0.01	88.38
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.02	0.22	0.02	0.01	0.00	0.00	50.17	0.00	0.00	50.49
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.14
Pounds per day - Grading/Excavation	0.18	1.65	0.17	0.04	0.02	0.00	376.28	0.01	0.01	378.69
Tons per const. Period - Grading/Excavation	0.01	0.09	0.01	0.00	0.00	0.00	20.70	0.00	0.00	20.83
Pounds per day - Drainage/Utilities/Sub-Grade	0.09	0.83	0.09	0.02	0.01	0.00	188.14	0.01	0.00	189.34
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.02	0.00	0.00	0.00	0.00	4.14	0.00	0.00	4.17
Pounds per day - Paving	0.08	0.72	0.07	0.02	0.01	0.00	180.74	0.01	0.00	181.75
Tons per const. Period - Paving	0.00	0.02	0.00	0.00	0.00	0.00	5.96	0.00	0.00	6.00
Total tons per construction project	0.01	0.13	0.01	0.00	0.00	0.00	30.94	0.00	0.00	31.13

Note: Water Truck default values can be overridden in cells D145 through D148, and F145 through F148.

Water Truck Emissions User Input	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Vehicle/Day	Default Values Miles Traveled/Vehicle/Day	Calculated Daily VMT
Grubbing/Land Clearing - Exhaust	1	1	10.00	40.00	10.00
Grading/Excavation - Exhaust	2	1	40.00	40.00	80.00
Drainage/Utilities/Subgrade	1	1	40.00	40.00	40.00
Paving	0	1		40.00	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Grading/Excavation (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Paving (grams/mile)	0.07	0.36	1.47	0.10	0.04	0.02	1,574.91	0.00	0.05	1,590.43
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.01	0.03	0.00	0.00	0.00	35.06	0.00	0.00	35.40
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.10
Pounds per day - Grading/Excavation	0.01	0.06	0.27	0.02	0.01	0.00	280.47	0.00	0.01	283.24
Tons per const. Period - Grading/Excavation	0.00	0.00	0.01	0.00	0.00	0.00	15.43	0.00	0.00	15.58
Pounds per day - Drainage/Utilities/Sub-Grade	0.01	0.03	0.13	0.01	0.00	0.00	140.24	0.00	0.00	141.62
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	3.09	0.00	0.00	3.12
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.02	0.00	0.00	0.00	18.61	0.00	0.00	18.79

Note: Fugitive dust default values can be overridden in cells D171 through D173.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing	2.50	2.43	25.00	0.07	5.20	0.01
Fugitive Dust - Grading/Excavation	2.50	2.43	25.00	1.38	5.20	0.29
Fugitive Dust - Drainage/Utilities/Subgrade	2.00	2.43	20.00	0.44	4.16	0.09

Off-Road Equipment Emissions

Grubbing/Land Clearing	Default Number of Vehicles	Mitigation Option: Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1		Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Graders	0.84	4.69	8.36	0.47	0.43	0.01	629.41	0.20	0.01	635.92
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rubber Tired Dozers	1.18	4.43	12.71	0.62	0.57	0.01	870.62	0.27	0.01	879.64
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grubbing/Land Clearing	pounds per day	2.02	9.12	21.07	1.09	1.00	0.01	1,500.03	0.47	0.01	1,515.56
Grubbing/Land Clearing	tons per phase	0.01	0.03	0.06	0.00	0.00	0.00	4.13	0.00	0.00	4.17

Grading/Excavation	Default Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Mitigation Option Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1		Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00	4		Model Default Tier	Excavators	0.34	1.93	4.35	0.13	0.12	0.01	821.43	0.26	0.01	829.96
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Graders	1.67	9.39	16.72	0.94	0.86	0.01	1,258.82	0.39	0.01	1,271.83
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00	3		Model Default Tier	Rollers	0.26	1.94	2.49	0.17	0.16	0.00	263.91	0.08	0.00	266.64
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	3		Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	4		Model Default Tier	Scrapers	3.12	23.94	38.67	1.52	1.40	0.04	4,154.77	1.29	0.04	4,197.89
0.00	2		Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation	pounds per day	5.39	37.20	62.22	2.77	2.55	0.06	6,498.92	2.02	0.06	6,566.32
Grading/Excavation	tons per phase	0.30	2.05	3.42	0.15	0.14	0.00	357.44	0.11	0.00	361.15

Drainage/Utilities/Subgrade	Default Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Mitigation Option Default Equipment Tier		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*		Equipment Tier		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1		Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Forklifts	0.09	0.61	0.80	0.06	0.06	0.00	77.76	0.02	0.00	78.57
0.00	1		Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1		Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1		Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1		Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	4		Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00	2		Model Default Tier	Tractors/Loaders/Backhoes	0.87	9.21	9.30	0.47	0.43	0.01	1,426.51	0.44	0.01	1,441.35
2.00			Model Default Tier	Trenchers	0.46	2.72	4.17	0.32	0.29	0.00	348.31	0.11	0.00	351.92
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles	Equipment Tier	Type		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Drainage/Utilities/Sub-Grade	pounds per day		1.43	12.54	14.27	0.85	0.78	0.02	1,852.57	0.58	0.02	1,871.83
Drainage/Utilities/Sub-Grade	tons per phase		0.03	0.28	0.31	0.02	0.02	0.00	40.76	0.01	0.00	41.18

Default	Mitigation Option

Paving	Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Cement and Mortar Mixers	0.03	0.17	0.20	0.01	0.01	0.00	28.06	0.00	0.00	28.21
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Forklifts	0.08	0.60	0.70	0.05	0.05	0.00	75.94	0.02	0.00	76.75
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Graders	0.75	4.61	7.40	0.41	0.38	0.01	614.09	0.20	0.01	620.60
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00	1		Model Default Tier	Pavers	0.27	2.79	2.90	0.14	0.13	0.00	444.23	0.14	0.00	448.95
1.00	1		Model Default Tier	Paving Equipment	0.21	2.49	2.18	0.11	0.10	0.00	394.24	0.13	0.00	398.44
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1		Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles	Equipment Tier	Type		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Paving		pounds per day	1.34	10.66	13.39	0.73	0.67	0.02	1,556.57	0.49	0.01	1,572.94
Paving		tons per phase	0.04	0.35	0.44	0.02	0.02	0.00	51.37	0.02	0.00	51.91
Total Emissions all Phases (tons per construction period) =>			0.38	2.70	4.24	0.20	0.18	0.00	453.69	0.14	0.00	458.40

Road Construction Emissions Model
Data Entry Worksheet

Version 8.1.0

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	I-Street Bridge Construction - Phases 5 to 7	
Construction Start Year	2018	Enter a Year between 2014 and 2025 (inclusive)
Project Type	3	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	19.75	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	0.61	miles
Total Project Area	2.43	acres
Maximum Area Disturbed/Day	2.43	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing	0.00	0.00	0.00
	Grading/Excavation	0.00	0.00	0.00
	Drainage/Utilities/Sub-Grade	0.00	0.00	0.00
	Paving	0.00	0.00	0.00
Asphalt	Grubbing/Land Clearing	0.00	0.00	0.00
	Grading/Excavation	0.00	0.00	0.00
	Drainage/Utilities/Sub-Grade	0.00	0.00	0.00
	Paving	0.00	0.00	0.00

Mitigation Options

On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation		Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/ceqa/mitigation.shtml). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	18.00	1.98	7/1/2018	1/1/2018
Grading/Excavation	7.00	7.90	5/1/2018	7/3/2019
Drainage/Utilities/Sub-Grade	5.00	6.91	4/1/2020	2/1/2020
Paving	0.00	2.96		7/3/2020
Totals (Months)	30		Note: You have entered a non-default starting date. Please provide starting date for all phases, or default values for other phases will be used.	

Please note: You have entered a different number of months than the project length shown in cell D16.
Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing	0.00	30.00		0	0.00
Miles/round trip: Grading/Excavation	0.00	30.00	0	0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	0.00	30.00		0	0.00
Miles/round trip: Paving	0.00	30.00		0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.49	0.10	0.04	0.02	1,581.29	0.00	0.05	1,596.87
Grading/Excavation (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Asphalt Hauling emission default values can be overridden in cells D87 through D90, and F87 through F90.

Asphalt Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing	0.00	30.00		0	0.00
Miles/round trip: Grading/Excavation	0.00	30.00		0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade	0.00	30.00		0	0.00
Miles/round trip: Paving	0.00	30.00		0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.49	0.10	0.04	0.02	1,581.29	0.00	0.05	1,596.87
Grading/Excavation (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D113 through D118.

Worker Commute Emissions User Input	User Override of Worker Commute Default Values	Default Values	Calculated Daily Trips	Calculated Daily VMT
Miles/ one-way trip	7	20		
One-way trips/day	2	2		
No. of employees: Grubbing/Land Clearing	40	7	80	560.00
No. of employees: Grading/Excavation	25	29	50	350.00
No. of employees: Drainage/Utilities/Sub-Grade	8	19	16	112.00
No. of employees: Paving	0	9	0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.03	1.24	0.13	0.05	0.02	0.00	385.76	0.01	0.01	387.67
Grading/Excavation (grams/mile)	0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91
Draining/Utilities/Sub-Grade (grams/mile)	0.02	1.08	0.11	0.05	0.02	0.00	371.46	0.01	0.00	373.08
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	1.11	2.98	0.24	0.00	0.00	0.00	86.59	0.02	0.01	89.95
Grading/Excavation (grams/trip)	1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49
Draining/Utilities/Sub-Grade (grams/trip)	1.00	2.55	0.20	0.00	0.00	0.00	84.03	0.01	0.01	86.84
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.23	2.05	0.21	0.06	0.02	0.00	491.53	0.01	0.01	494.47
Tons per const. Period - Grubbing/Land Clearing	0.05	0.41	0.04	0.01	0.00	0.00	97.32	0.00	0.00	97.91
Pounds per day - Grading/Excavation	0.15	1.38	0.14	0.04	0.02	0.00	313.57	0.01	0.01	315.57
Tons per const. Period - Grading/Excavation	0.01	0.11	0.01	0.00	0.00	0.00	24.14	0.00	0.00	24.30
Pounds per day - Drainage/Utilities/Sub-Grade	0.04	0.36	0.04	0.01	0.00	0.00	94.69	0.00	0.00	95.18
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.02	0.00	0.00	0.00	0.00	5.21	0.00	0.00	5.24
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.06	0.53	0.05	0.01	0.01	0.00	126.67	0.00	0.00	127.44

Note: Water Truck default values can be overridden in cells D145 through D148, and F145 through F148.

Water Truck Emissions User Input	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Vehicle/Day	Default Values Miles Traveled/Vehicle/Day	Calculated Daily VMT
Grubbing/Land Clearing - Exhaust	0	1	10.00	40.00	0.00
Grading/Excavation - Exhaust	0	1	40.00	40.00	0.00
Drainage/Utilities/Subgrade	0	1	40.00	40.00	0.00
Paving	0	1		40.00	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.49	0.10	0.04	0.02	1,581.29	0.00	0.05	1,596.87
Grading/Excavation (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Fugitive dust default values can be overridden in cells D171 through D173.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing	1.00	2.43	20.00	3.96	4.16	0.82
Fugitive Dust - Grading/Excavation	1.50	2.43	30.00	2.31	6.24	0.48
Fugitive Dust - Drainage/Utilities/Subgrade	2.00	2.43	40.00	2.20	8.32	0.46

Off-Road Equipment Emissions

Grubbing/Land Clearing	Default Number of Vehicles	Mitigation Option: Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Bore/Drill Rigs	0.63	5.20	8.07	0.26	0.24	0.03	2,563.40	0.81	0.02	2,590.31
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Cranes	0.55	4.67	6.77	0.27	0.25	0.01	745.32	0.23	0.01	753.13
0.00	1		Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Generator Sets	0.44	3.55	3.70	0.23	0.23	0.01	593.37	0.04	0.00	595.68
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Pumps	1.58	12.18	12.69	0.81	0.81	0.02	2,002.61	0.14	0.02	2,010.60
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day		3.20	25.60	31.23	1.57	1.53	0.06	5,904.70	1.22	0.05	5,949.72
Grubbing/Land Clearing	tons per phase		0.63	5.07	6.18	0.31	0.30	0.01	1,169.13	0.24	0.01	1,178.04

Grading/Excavation	Default Number of Vehicles	Mitigation Option: Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Bore/Drill Rigs	0.67	5.32	8.88	0.29	0.27	0.03	2,591.21	0.81	0.02	2,618.12
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Cranes	0.57	4.89	7.11	0.29	0.26	0.01	753.23	0.23	0.01	761.05
0.00	2		Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	4		Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Forklifts	0.09	0.61	0.80	0.06	0.06	0.00	77.76	0.02	0.00	78.57
1.00			Model Default Tier	Generator Sets	0.48	3.57	3.92	0.25	0.25	0.01	593.37	0.04	0.00	595.77
0.00	2		Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Pumps	1.71	12.23	13.42	0.89	0.89	0.02	2,002.61	0.15	0.02	2,010.89
0.00	3		Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	3		Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	4		Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Tractors/Loaders/Backhoes	0.58	6.14	6.20	0.31	0.29	0.01	951.01	0.30	0.01	960.90
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Model Default Tier	Welders	1.92	8.08	7.31	0.49	0.49	0.01	902.08	0.17	0.01	908.65

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation	pounds per day	6.02	40.85	47.64	2.58	2.51	0.08	7,871.26	1.73	0.07	7,933.94
Grading/Excavation	tons per phase	0.46	3.15	3.67	0.20	0.19	0.01	606.09	0.13	0.01	610.91

Drainage/Utilities/Subgrade	Default Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Mitigation Option Default Equipment Tier		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*		Equipment Tier		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	1		Model Default Tier	Air Compressors	0.66	5.01	4.61	0.30	0.30	0.01	769.77	0.06	0.01	772.99
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Concrete/Industrial Saws	0.21	1.82	1.63	0.10	0.10	0.00	292.67	0.02	0.00	293.79
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Excavators	0.59	3.75	6.79	0.21	0.19	0.02	1,581.29	0.51	0.01	1,598.35
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1		Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1		Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1		Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1		Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	4		Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles	Equipment Tier	Type		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Drainage/Utilities/Sub-Grade	pounds per day	1.46	10.58	13.03	0.61	0.59	0.03	2,643.74	0.59	0.02	2,665.13
	Drainage/Utilities/Sub-Grade	tons per phase	0.08	0.58	0.72	0.03	0.03	0.00	145.41	0.03	0.00	146.58

Default	Mitigation Option

Paving	Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1		Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1		Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	1		Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	2		Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles	Equipment Tier	Type		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Paving	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>			1.18	8.80	10.57	0.54	0.53	0.02	1,920.62	0.41	0.02	1,935.54

Appendix D

Summary of Limitations and Uncertainties Associated With Emissions Modeling

Limitations and Uncertainties with Modeling

EMFAC

Although EMFAC can calculate CO_2 emissions from mobile sources, the model does have limitations when it comes to accurately reflecting changes in CO_2 emissions due to impacts on traffic. According to the National Cooperative Highway Research Program report, *Development of a Comprehensive Modal Emission Model* (April 2008) and a 2009 University of California study (Barth and Boriboonsomsin 2009), brief but rapid accelerations, such as those occurring during congestion, can contribute significantly to a vehicle's CO_2 emissions during a typical urban trip. Current emission-factor models are insensitive to the distribution of such modal events (i.e., cruise, acceleration, deceleration, and idling) in the operation of a vehicle and instead estimate emissions by average trip speed. This limitation creates an uncertainty in the model's results when compared to the estimated emissions of the various alternatives with baseline in an attempt to determine impacts. Although work by EPA and the ARB is underway on modal-emission models, neither agency has yet approved a modal emissions model that can be used to conduct this more accurate modeling.

The ARB is currently not using EMFAC to create its inventory of greenhouse gas emissions. It is unclear why the ARB has made this decision. Their website only states:

> REVISION: Both the EMFAC and OFFROAD Models develop CO2 and CH4 [methane] emission estimates; however, they are not currently used as the basis for [ARB's] official [greenhouse gas] inventory which is based on fuel usage information. . . However, ARB is working towards reconciling the emission estimates from the fuel usage approach and the models. (California Air Resources Board 2010)

Other Variables

With the current science, project-level analysis of greenhouse gas emissions has limitations. Although a greenhouse gas analysis is included for this project, there are numerous key greenhouse gas variables that are likely to change dramatically during the design life of the proposed project and would thus dramatically change the projected CO_2 emissions.

First, vehicle fuel economy is increasing. The EPA's annual report, "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2012 ," which provides data on the fuel economy and technology characteristics of new light-duty vehicles including cars, minivans, sport utility vehicles, and pickup trucks, confirms that average fuel economy has improved each year beginning in 2005, and is now at a record high (U.S. Environmental Protection Agency 2013). Corporate Average Fuel Economy (CAFE) standards remained the same between model years 1995 and 2003 and subsequently began setting increasingly higher fuel economy standards for future vehicle model years. The EPA estimates that light duty fuel economy rose by 16% from 2007 to 2012. Table E-1 shows the increases in required fuel economy standards for cars and trucks between Model Years 2012 and 2025 as available from the National Highway Traffic Safety Administration for the 2012-2016 and 2017-2025 CAFE Standards.

Table E-1. Average Required Fuel Economy (mpg)

	2012	2013	2014	2015	2016	2018	2020	2025
Passenger Cars	33.3	34.2	34.9	36.2	37.8	41.1 to 41.6	44.2 to 44.8	55.3 to 56.2
Light Trucks	25.4	26	26.6	27.5	28.8	29.6 to 30.0	30.6 to 31.2	39.3 to 40.3
Combined	29.7	30.5	31.3	32.6	34.1	36.1 to 36.5	38.3 to 38.9	48.7 to 49.7
Source: U.S. Environmental Protection Agency 2013								

Second, near zero carbon vehicles will come into the market during the design life of this project. According to the 2013 Annual Energy Outlook:

> "LDVs that use diesel, other alternative fuels, hybrid-electric, or all-electric systems play a significant role in meeting more stringent GHG emissions and CAFE standards over the projection period. Sales of such vehicles increase from 20 percent of all new LDV sales in 2011 to 49 percent in 2040 in the AEO2013 Reference case." (U.S. Energy Information Administration 2013)

The greater percentage of alternative fuel vehicles on the road in the future will reduce overall GHG emissions as compared to scenarios in which vehicle technologies and fuel efficiencies do not change.

Third, California has recently adopted a low-carbon transportation fuel standard in 2009 to reduce the carbon intensity of transportation fuels by 10 percent by 2020. The regulation became effective on January 12, 2010 (codified in title 17, California Code of Regulations, Sections 95480-95490). Beginning January 1, 2011, transportation fuel producers and importers must meet specified average carbon intensity requirements for fuel in each calendar year.

Lastly, driver behavior has been changing as the U.S. economy and oil prices have changed. In its January 2008 report, "Effects of Gasoline Prices on Driving Behavior and Vehicle Market," the Congressional Budget Office found the following results based on data collected from California (U.S. Congressional Budget Office 2008):

1. freeway motorists adjust to higher gas prices by making fewer trips and driving more slowly;
2. the market share of sports utility vehicles is declining; and
3. the average prices for larger, less-fuel-efficient models declined from 2003 to 2008 as average prices for the most-fuel-efficient automobiles have risen, showing an increase in demand for the more fuel efficient vehicles.

More recent reports from the Energy Information Agency and Bureau of Economic Analysis also show slowing re-growth of vehicle sales in the years since its dramatic drop in 2009 due to the Great Recession as gasoline prices continue to climb to $4 per gallon and beyond (U.S. Energy Information Administration 2013: Table 53, U.S. Bureau of Economic Analysis 2014).

Limitations and Uncertainties with Impact Assessment

Taken from p. 5-22 of the National Highway Traffic Safety Administration Final EIS for MY2017-2025 CAFE Standards (July 2012), Figure illustrates how the range of uncertainties in assessing greenhouse gas impacts grows with each step of the analysis:

> "Moss and Schneider (2000) characterize the "cascade of uncertainty" in climate change simulations Figure). As indicated in Figure , the emission estimates used in this EIS have narrower bands of uncertainty than the global climate effects, which are less uncertain than regional climate change effects. The effects on climate are, in turn, less uncertain than the impacts of climate change on affected resources (such as terrestrial and coastal ecosystems, human health, and other resources […] Although the uncertainty bands broaden with each successive step in the analytic chain, all values within the bands are not equally likely; the mid-range values have the highest likelihood."(National Highway Traffic Safety Administration 2012:5-21).

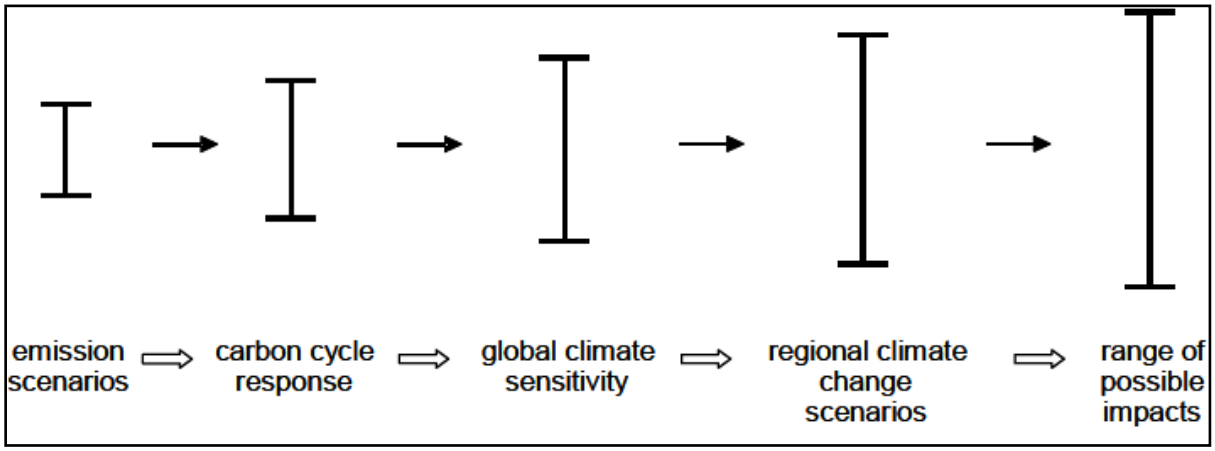


Figure E-1. Cascade of Uncertainties

Much of the uncertainty in assessing an individual project's impact on climate change surrounds the global nature of the climate change. Even assuming that the target of meeting the 1990 levels of emissions is met, there is no regulatory or other framework in place that would allow for a ready assessment of what any modeled increase in CO_2 emissions would mean for climate change given the overall California greenhouse gas emissions inventory of approximately 430 million tons of CO_2 equivalent. This uncertainty only increases when viewed globally. The IPCC has created multiple scenarios to project potential future global greenhouse gas emissions as well as to evaluate potential changes in global temperature, other climate changes, and their effect on human and natural systems. These scenarios vary in terms of the type of economic development, the amount of overall growth, and the steps taken to reduce greenhouse gas emissions. Non-mitigation IPCC scenarios project an increase in global greenhouse gas emissions by 9.7 up to 36.7 billion metric tons CO_2 from 2000 to 2030, which represents an increase of between 25 and 90%. (Intergovernmental Panel on Climate Change 2007)

The assessment is further complicated by the fact that changes in greenhouse gas emissions can be difficult to attribute to a particular project because the projects often cause shifts in the locale for some type of greenhouse gas emissions, rather than causing "new" greenhouse gas emissions. It is difficult to assess the extent to which any project level increase in CO_2 emissions represents

a net global increase, reduction, or no change; there are no models approved by regulatory agencies that operate at the global or even statewide scale.

References

Barth, M., and Boriboonsomsin, K. 2009. Energy and emissions impacts of a freeway-based dynamic eco-driving system. Transportation Research Part D, 14, 6, 400-410.

California Air Resources Board. 2010. Off-Road Emissions Inventory Program. Available:<http://www.arb.ca.gov/msei/offroad.htm>. Accessed: February 12, 2014.

Intergovernmental Panel on Climate Change. 2007. Mitigation of Climate Change In: Climate Change 2007: Working Group III: The Physical Science Basis: Fourth Assessment Report. Available: http://www.ipcc.ch/publications_and_data/ar4/wg3/en/spmsspm-b.html. Accessed: February 12, 2014.

National Highway Traffic Safety Administration. 2012. Corporate Average Fuel Economy Standards: Passenger Cars and Light Trucks Model Years 2017-2025. Final Environmental Impact Statement. July 2012. Docket No. NHTSA-2011-0056. Available:< http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/FINAL_EIS.pdf>. Accessed: February 12, 2014.

U.S. Bureau of Economic Analysis. 2014. National Economic Accounts: Supplemental Estimates. Excel Spreadsheet. Available:< http://bea.gov/national/>. Accessed: February 12, 2014.

U.S. Congressional Budget Office. 2008. Effects of Gasoline Prices on Driving Behavior and Vehicle Market. January 2008. Available: < http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/88xx/doc8893/01-14-gasolineprices.pdf>. Accessed: February 12, 2014.

U.S. Energy Information Administration. 2013. Annual Energy Outlook 2013. Available:< http://www.eia.gov/forecasts/aeo/pdf/0383(2013).pdf>. Accessed: February 12, 2014.

U.S. Environmental Protection Agency. 2013. Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2012. Available:< http://www.epa.gov/fueleconomy/fetrends/1975-2012/420r13001.pdf>. Accessed: February 12, 2014.

Appendix E

Regional Emission Calculations

Scenario	Year	MPH Non-Truck Speeds	MPH Truck Speeds	VMT (miles/day) Non-Trucks	VMT (miles/day) Trucks	VMT (miles/day) Total	lb/day ROG_RUNEX	lb/day TOG_RUNEX	lb/day CO_RUNEX	lb/day NOx_RUNEX	lb/day CO2_RUNEX	lb/day PM10_RUNEX	lb/day PM10_TW	lb/day PM10_BW	lb/day PM2_5_RUNEX	lb/day PM25_TW	lb/day PM25_BW	lb/day PM10_Total	lb/day PM25_Total	lb/day SOx	lb/day CH4	lb/day N2O	lb/day GHG (CO2e)
Existing	2014	5	5	9,349	1,481	10,831	9	12	88	25	29,711	0.84	0.20	1.09	0.79	0.05	0.47	2.13	1.31	0.30	2.15	0.44	29,888
Existing	2014	10	10	81,892	17,720	99,612	67	85	702	264	221,691	7.64	1.91	10.57	7.25	0.48	4.53	20.13	12.26	2.21	13.51	4.05	223,143
Existing	2014	15	15	208,755	46,996	255,751	100	129	1,505	457	421,330	11.19	4.79	26.58	10.60	1.20	11.39	42.55	23.19	4.21	22.97	8.03	424,100
Existing	2014	20	20	5,867,489	1,033,438	6,900,927	1,805	2,348	36,656	11,660	9,321,175	232.36	129.04	769.99	220.28	32.26	329.99	1,131.38	582.53	93.07	439.16	187.34	9,383,117
Existing	2014	25	25	2,523,618	587,857	3,111,475	550	727	14,560	2,800	3,399,527	44.67	56.72	275.63	42.04	14.18	118.13	377.01	174.34	34.06	148.07	73.22	3,423,077
Existing	2014	30	30	2,352,430	465,437	2,817,867	415	543	11,909	2,784	2,696,746	40.73	52.28	254.04	38.47	13.07	108.87	347.05	160.41	26.98	105.25	60.60	2,715,751
Existing	2014	35	35	4,954,172	992,934	5,947,106	726	949	23,501	5,082	5,157,612	71.19	110.82	516.57	67.24	27.71	221.39	698.58	316.33	51.62	185.45	121.16	5,194,911
Existing	2014	40	40	5,271,453	1,184,333	6,455,786	698	912	23,985	5,244	5,254,955	74.02	119.96	558.24	69.99	29.99	239.25	752.23	339.23	52.59	178.05	128.11	5,293,891
Existing	2014	45	45	4,855,238	1,315,016	6,170,254	695	892	21,802	7,794	5,327,245	111.56	123.10	557.27	106.03	30.77	238.83	791.92	375.64	53.03	158.92	136.90	5,367,975
Existing	2014	50	50	2,108,556	736,600	2,845,156	325	416	9,562	4,428	2,529,838	57.40	57.15	269.39	54.62	14.29	115.45	383.95	184.36	25.15	72.07	66.59	2,549,503
Existing	2014	55	55	4,037,759	1,539,083	5,576,842	650	831	18,830	8,166	5,099,175	130.33	112.03	516.47	124.08	28.01	221.34	758.82	373.43	50.72	144.87	133.66	5,138,652
Existing	2014	60	60	7,010,089	3,173,300	10,183,389	1,253	1,615	35,028	12,105	9,706,434	267.61	192.68	954.51	254.83	48.17	409.07	1,414.80	712.08	96.81	294.11	251.55	9,781,331
Existing	2014	65	65	2,342,165	1,253,973	3,596,138	558	707	13,182	7,204	4,219,503	150.90	78.26	353.84	143.92	19.57	151.65	583.01	315.14	41.82	116.84	111.16	4,252,231
Existing	2014	70	70	1,283,427	579,457	1,862,884	223	296	6,498	933	1,926,287	9.12	32.86	150.93	8.45	8.21	64.68	192.91	81.35	19.33	63.31	46.55	1,940,395
2020 No Build	2020	5	5	19,200	3,916	23,115	10	19	107	54	60,663	1.03	0.45	2.47	0.96	0.11	1.06	3.95	2.14	0.58	2.41	0.84	60,953
2020 No Build	2020	10	10	210,053	37,761	247,813	72	126	956	454	503,235	7.52	4.80	25.59	7.06	1.20	10.97	37.90	19.22	4.81	16.46	7.39	505,655
2020 No Build	2020	15	15	402,964	82,834	485,798	89	142	1,582	596	732,897	10.46	9.19	50.02	9.82	2.30	21.44	69.67	33.56	7.09	22.02	11.08	736,450
2020 No Build	2020	20	20	6,827,301	1,195,604	8,022,904	984	1,896	24,478	8,295	9,902,107	117.92	153.63	882.01	110.65	38.41	378.01	1,153.57	527.06	96.86	262.59	156.54	9,950,942
2020 No Build	2020	25	25	3,047,672	708,177	3,755,849	292	413	9,930	2,095	3,734,879	33.52	68.98	332.51	31.29	17.25	142.50	435.01	191.04	36.25	90.60	62.62	3,754,010
2020 No Build	2020	30	30	2,950,709	597,502	3,548,211	222	313	8,395	2,100	3,114,998	27.91	66.61	319.28	26.14	16.65	136.84	413.81	179.62	30.21	65.81	53.88	3,131,119
2020 No Build	2020	35	35	5,640,106	1,157,974	6,798,081	338	485	15,052	3,319	5,414,088	41.67	128.34	591.23	38.95	32.09	253.38	761.24	324.42	52.40	104.57	97.28	5,442,796
2020 No Build	2020	40	40	6,115,228	1,447,196	7,562,424	327	465	15,745	3,317	5,643,980	42.19	142.03	654.52	39.49	35.51	280.51	838.75	355.50	54.78	103.47	106.03	5,674,976
2020 No Build	2020	45	45	5,083,972	1,421,098	6,505,070	297	414	12,362	4,834	5,369,509	51.01	135.70	596.92	48.15	33.93	255.82	783.64	337.89	52.06	80.89	113.19	5,401,770
2020 No Build	2020	50	50	2,451,454	888,057	3,339,511	162	219	6,014	3,180	2,851,836	31.39	70.56	320.75	29.72	17.64	137.47	422.70	184.82	27.73	41.53	62.93	2,869,676
2020 No Build	2020	55	55	4,227,036	1,692,786	5,919,822	270	369	10,525	4,678	5,103,957	55.50	123.40	553.66	52.52	30.85	237.28	732.56	320.65	49.68	75.58	111.86	5,135,717
2020 No Build	2020	60	60	7,064,400	3,294,422	10,358,822	490	691	18,164	6,581	9,344,903	121.91	202.79	1,009.86	115.53	50.70	432.80	1,334.56	599.03	91.23	148.05	205.91	9,403,615
2020 No Build	2020	65	65	2,234,419	1,186,059	3,420,478	189	263	5,800	3,309	3,758,304	48.14	77.91	339.94	45.67	19.48	145.69	465.99	210.83	36.58	52.98	86.01	3,782,579
2020 No Build	2020	70	70	1,313,709	582,908	1,896,617	95	135	3,396	522	1,735,853	7.81	33.45	153.66	7.20	8.36	65.86	194.92	81.42	17.13	34.17	34.02	1,745,825
2020 Build	2020	5	5	22,041	4,273	26,313	11	21	121	59	68,633	1.15	0.52	2.79	1.08	0.13	1.19	4.45	2.40	0.65	2.73	0.93	68,956
2020 Build	2020	10	10	200,933	35,982	236,914	69	120	914	433	480,823	7.18	4.58	24.44	6.74	1.15	10.48	36.21	18.36	4.59	15.73	7.06	483,133
2020 Build	2020	15	15	397,903	81,761	479,664	88	140	1,562	589	723,606	10.32	9.07	49.39	9.70	2.27	21.17	68.78	33.13	7.00	21.74	10.94	727,114
2020 Build	2020	20	20	6,835,977	1,197,391	8,033,368	985	1,899	24,511	8,307	9,915,342	118.09	153.83	883.21	110.81	38.46	378.52	1,155.13	527.78	96.99	262.94	156.76	9,964,245
2020 Build	2020	25	25	3,064,002	711,923	3,775,925	293	415	9,983	2,107	3,754,812	33.69	69.35	334.29	31.46	17.34	143.27	437.33	192.06	36.44	91.08	62.96	3,774,045
2020 Build	2020	30	30	2,940,111	595,884	3,535,996	222	312	8,366	2,094	3,104,659	27.82	66.39	318.21	26.05	16.60	136.38	412.42	179.02	30.11	65.59	53.71	3,120,730
2020 Build	2020	35	35	5,647,983	1,162,547	6,810,531	339	487	15,083	3,329	5,426,080	41.78	128.60	592.40	39.05	32.15	253.88	762.77	325.09	52.51	104.80	97.56	5,454,868
2020 Build	2020	40	40	6,115,799	1,445,906	7,561,704	327	465	15,742	3,315	5,642,585	42.18	142.01	654.43	39.47	35.50	280.47	838.61	355.44	54.76	103.44	105.98	5,673,566
2020 Build	2020	45	45	5,067,619	1,416,672	6,484,291	296	413	12,322	4,819	5,352,484	50.85	135.27	595.02	47.99	33.82	255.01	781.14	336.82	51.89	80.64	112.84	5,384,644
2020 Build	2020	50	50	2,442,824	889,552	3,332,376	162	219	6,004	3,183	2,849,214	31.40	70.45	320.26	29.73	17.61	137.25	422.11	184.60	27.71	41.48	62.95	2,867,058
2020 Build	2020	55	55	4,326,705	1,733,232	6,059,937	276	378	10,774	4,790	5,225,107	56.83	126.32	566.78	53.77	31.58	242.90	749.93	328.26	50.86	77.37	114.53	5,257,623
2020 Build	2020	60	60	7,000,869	3,259,770	10,260,639	485	684	17,988	6,513	9,253,556	120.67	200.85	1,000.11	114.35	50.21	428.62	1,321.62	593.18	90.34	146.61	203.82	9,311,674
2020 Build	2020	65	65	2,232,954	1,184,646	3,417,600	188	263	5,795	3,305	3,754,695	48.09	77.84	339.63	45.62	19.46	145.56	465.56	210.63	36.55	52.93	85.91	3,778,944
2020 Build	2020	70	70	1,313,523	582,913	1,896,436	95	135	3,396	522	1,735,718	7.80	33.45	153.65	7.20	8.36	65.85	194.90	81.41	17.13	34.17	34.02	1,745,689
2020 Build (Assignment Only with No Build Trip Dist)	2020	5	5	23,026	4,436	27,462	12	22	126	62	71,576	1.20	0.54	2.90	1.12	0.13	1.24	4.64	2.50	0.68	2.84	0.97	71,911
2020 Build (Assignment Only with No Build Trip Dist)	2020	10	10	201,239	36,113	237,352	69	121	916	434	481,866	7.20	4.59	24.50	6.76	1.15	10.50	36.29	18.40	4.60	15.76	7.08	484,182
2020 Build (Assignment Only with No Build Trip Dist)	2020	15	15	394,641	80,588	475,228	87	139	1,546	581	716,369	10.20	8.99	48.88	9.58	2.25	20.95	68.07	32.78	6.93	21.52	10.81	719,835
2020 Build (Assignment Only with No Build Trip Dist)	2020	20	20	6,820,715	1,194,153	8,014,868	983	1,894	24,453	8,285	9,891,832	117.80	153.47	881.08	110.53	38.37	377.61	1,152.35	526.50	96.76	262.32	156.36	9,940,613
2020 Build (Assignment Only with No Build Trip Dist)	2020	25	25	3,079,867	715,223	3,795,090	295	417	10,033	2,117	3,773,627	33.86	69.70	335.97	31.61	17.43	143.99	439.53	193.02	36.62	91.53	63.26	3,792,954
2020 Build (Assignment Only with No Build Trip Dist)	2020	30	30	2,941,647	598,445	3,540,091	222	312	8,379	2,101	3,109,894	27.89	66.48	318.68	26.12	16.62	136.58	413.04	179.31	30.16	65.70	53.86	3,126,006
2020 Build (Assignment Only with No Build Trip Dist)	2020	35	35	5,668,058	1,161,521	6,829,579	340	487	15,119	3,331	5,437,634	41.84	128.92	593.90	39.11	32.23	254.53	764.67	325.87	52.63	105.03	97.66	5,466,454
2020 Build (Assignment Only with No Build Trip Dist)	2020	40	40	6,037,810	1,426,001	7,463,811	322	459	15,536	3,270	5,568,653	41.62	140.16	645.92	38.95	35.04	276.82	827.70	350.81	54.05	102.09	104.56	5,599,221
2020 Build (Assignment Only with No Build Trip Dist)	2020	45	45	5,118,621	1,430,524	6,549,145	299	417	12,445	4,866	5,405,663	51.36	136.62	600.95	48.47	34.15	257.55	788.93	340.17	52.41	81.44	113.95	5,438,140
2020 Build (Assignment Only with No Build Trip Dist)	2020	50	50	2,401,601	868,459	3,270,060	159	215	5,888	3,110	2,791,372	30.71	69.08	314.02	29.07	17.27	134.58	413.80	180.92	27.15	40.66	61.57	2,808,826
2020 Build (Assignment Only with No Build Trip Dist)	2020	55	55	4,300,381	1,722,321	6,022,703	274	376	10,708	4,760	5,192,765	56.47	125.54	563.28	53.44	31.39	241.41	745.30	326.23	50.54	76.90	113.81	5,225,078
2020 Build (Assignment Only with No Build Trip Dist)	2020	60	60	7,039,698	3,284,799	10,324,497	488	689	18,105	6,561	9,314,985	121.54	202.13	1,006.58	115.18	50.53	431.39	1,330.25	597.11	90.94	147.57	205.28	9,373,517
2020 Build (Assignment Only with No Build Trip Dist)	2020	65	65	2,232,653	1,185,810	3,418,463	188	263	5,797	3,308	3,756,575	48.12	77.87	339.76	45.65	19.47	145.61	465.76	210.73	36.56	52.95	85.98	3,780,842
2020 Build (Assignment Only with No Build Trip Dist)	2020	70	70	1,313,785	583,139	1,896,924	95	135	3,397	522	1,736,202	7.81	33.46	153.69	7.20	8.36	65.87	194.95	81.43	17.14	34.18	34.03	1,746,176

Scenario	Year	MPH Non-Truck Speeds	MPH Truck Speeds	VMT (miles/day) Non-Trucks	VMT (miles/day) Trucks	VMT (miles/day) Total	lb/day ROG_RUNEX	lb/day TOG_RUNEX	lb/day CO_RUNEX	lb/day NOx_RUNEX	lb/day CO2_RUNEX	lb/day PM10_RUNEX	lb/day PM10_TW	lb/day PM10_BW	lb/day PM2_5_RUNEX	lb/day PM25_TW	lb/day PM25_BW	lb/day PM10_Total	lb/day PM25_Total	lb/day SOx	lb/day CH4	lb/day N2O	lb/day GHG (CO2e)
2040 No Build	2040	5	5	40,520	4,708	45,228	6	14	98	59	82,732	0.59	0.88	4.40	0.55	0.22	1.88	5.87	2.65	0.75	1.24	0.89	83,003
2040 No Build	2040	10	10	181,818	33,535	215,353	26	54	419	323	334,215	1.97	4.32	22.30	1.83	1.08	9.56	28.60	12.47	3.03	4.06	4.93	335,636
2040 No Build	2040	15	15	433,887	90,105	523,992	39	64	742	395	595,422	3.48	10.19	54.07	3.24	2.55	23.17	67.74	28.96	5.46	6.41	8.62	597,886
2040 No Build	2040	20	20	7,986,934	1,429,634	9,416,568	395	746	11,666	4,510	8,626,598	41.79	188.07	977.56	38.86	47.02	418.95	1,207.42	504.83	79.67	80.83	125.37	8,662,086
2040 No Build	2040	25	25	3,352,749	795,769	4,148,518	95	140	4,328	720	2,888,699	12.92	77.14	366.80	11.98	19.28	157.20	456.85	188.46	25.65	25.17	40.78	2,900,211
2040 No Build	2040	30	30	3,403,713	695,163	4,098,876	81	118	3,895	692	2,604,481	10.62	78.58	369.33	9.88	19.64	158.28	458.53	187.80	23.44	19.35	38.79	2,615,303
2040 No Build	2040	35	35	6,902,515	1,507,615	8,410,131	131	203	7,485	1,145	4,889,513	17.50	162.90	737.20	16.25	40.73	315.94	917.60	372.92	43.63	33.06	76.64	4,910,748
2040 No Build	2040	40	40	8,391,410	2,047,765	10,439,175	130	194	8,510	1,145	5,634,238	18.65	200.30	910.46	17.32	50.07	390.20	1,129.41	457.59	50.19	35.49	91.10	5,659,372
2040 No Build	2040	45	45	6,242,522	1,829,903	8,072,425	123	176	6,042	1,298	5,299,685	17.22	176.76	748.40	16.12	44.19	320.74	942.38	381.05	48.34	25.50	106.58	5,328,644
2040 No Build	2040	50	50	3,113,481	1,210,415	4,323,896	64	86	2,938	712	3,021,389	10.37	97.49	418.42	9.74	24.37	179.32	526.27	213.44	27.77	13.01	65.33	3,039,065
2040 No Build	2040	55	55	4,631,698	2,065,088	6,696,787	84	113	4,356	916	4,618,528	14.49	148.13	637.96	13.58	37.03	273.41	800.58	324.02	41.97	20.62	99.06	4,645,356
2040 No Build	2040	60	60	9,346,661	4,664,791	14,011,452	154	216	8,288	1,522	9,670,507	27.29	283.27	1,395.36	25.46	70.82	598.01	1,705.92	694.29	86.83	45.57	203.48	9,725,706
2040 No Build	2040	65	65	1,847,032	924,717	2,771,748	40	54	1,557	425	2,367,048	7.04	66.03	276.60	6.60	16.51	118.54	349.67	141.65	21.61	10.00	51.92	2,381,088
2040 No Build	2040	70	70	1,474,243	764,578	2,238,821	25	36	1,295	145	1,348,960	3.89	39.49	181.39	3.58	9.87	77.74	224.76	91.19	11.43	9.69	22.77	1,355,264
2040 Build	2040	5	5	41,528	5,042	46,570	7	15	102	63	85,824	0.61	0.91	4.56	0.57	0.23	1.95	6.08	2.75	0.78	1.29	0.95	86,112
2040 Build	2040	10	10	177,873	32,462	210,335	25	52	408	313	325,604	1.92	4.22	21.74	1.79	1.05	9.32	27.88	12.16	2.95	3.96	4.78	326,982
2040 Build	2040	15	15	432,893	89,776	522,669	39	63	740	394	593,753	3.47	10.16	53.92	3.23	2.54	23.11	67.55	28.88	5.44	6.39	8.59	596,210
2040 Build	2040	20	20	8,006,056	1,434,656	9,440,712	396	748	11,697	4,525	8,650,807	41.91	188.57	980.27	38.97	47.14	420.12	1,210.75	506.22	79.89	81.05	125.79	8,686,411
2040 Build	2040	25	25	3,348,246	794,757	4,143,003	95	140	4,322	719	2,884,891	12.90	77.03	366.32	11.96	19.26	156.99	456.25	188.21	25.62	25.13	40.73	2,896,388
2040 Build	2040	30	30	3,386,927	691,923	4,078,851	81	118	3,876	689	2,591,895	10.57	78.19	367.53	9.83	19.55	157.51	456.30	186.89	23.33	19.25	38.61	2,602,665
2040 Build	2040	35	35	6,890,632	1,501,964	8,392,596	131	202	7,469	1,141	4,877,261	17.46	162.54	735.57	16.21	40.63	315.24	915.57	372.09	43.52	32.98	76.38	4,898,426
2040 Build	2040	40	40	8,389,911	2,047,608	10,437,519	130	194	8,509	1,144	5,633,461	18.65	200.27	910.32	17.31	50.07	390.14	1,129.24	457.52	50.19	35.49	91.09	5,658,593
2040 Build	2040	45	45	6,237,980	1,824,871	8,062,851	123	176	6,035	1,295	5,289,998	17.18	176.49	747.37	16.09	44.12	320.30	941.05	380.51	48.25	25.47	106.32	5,318,885
2040 Build	2040	50	50	3,080,191	1,198,175	4,278,366	64	85	2,908	705	2,990,135	10.26	96.47	414.04	9.64	24.12	177.45	520.77	211.20	27.49	12.87	64.66	3,007,632
2040 Build	2040	55	55	4,690,171	2,098,103	6,788,274	86	114	4,416	930	4,686,107	14.70	150.23	646.89	13.78	37.56	277.24	811.82	328.57	42.58	20.91	100.61	4,713,355
2040 Build	2040	60	60	9,334,284	4,652,919	13,987,203	154	215	8,273	1,519	9,650,795	27.24	282.75	1,392.73	25.41	70.69	596.88	1,702.72	692.98	86.65	45.49	202.99	9,705,860
2040 Build	2040	65	65	1,849,772	926,137	2,775,909	40	54	1,559	426	2,370,638	7.05	66.13	277.02	6.61	16.53	118.72	350.20	141.86	21.65	10.01	52.00	2,384,699
2040 Build	2040	70	70	1,474,324	764,538	2,238,862	25	36	1,295	145	1,348,970	3.89	39.49	181.39	3.58	9.87	77.74	224.77	91.19	11.43	9.69	22.77	1,355,274

Summary (lb/day)	Year	VMT(miles/day)	VMT(miles/day)	VMT(miles/day)	lb/day ROG_RUNEX	lb/day TOG_RUNEX	lb/day CO_RUNEX	lb/day NOx_RUNEX	lb/day CO2_RUNEX	lb/day PM10_RUNEX	lb/day PM10_TW	lb/day PM10_BW	lb/day PM2_5_RUNEX	lb/day PM25_TW	lb/day PM25_BW	lb/day PM10_Total	lb/day PM25_Total	lb/day SOx	lb/day CH4	lb/day N2O	lb/day GHG (CO2e)
Existing	2014	42,906,395	12,927,625	55,834,020	8,074	10,463	217,808	68,946	55,311,228	1,209.5	1,071.8	5,215.1	1,148.6	268.0	2,235.0	7,496.5	3,651.6	551.9	1,944.7	1,329.4	55,717,966
2020 No Build	2020	47,588,223	14,296,291	61,884,514	3,837	5,951	132,504	43,334	57,271,209	598.0	1,217.8	5,832.4	563.1	304.5	2,499.6	7,648.3	3,367.2	557.4	1,101.1	1,109.6	57,596,083
2020 Build	2020	47,609,243	14,302,451	61,911,694	3,837	5,951	132,559	43,365	57,287,314	597.9	1,218.5	5,834.6	563.0	304.6	2,500.5	7,651.0	3,368.2	557.5	1,101.2	1,110.0	57,612,289
2020 Build (Assignment Only with No Build Trip Dist)	2020	47,573,741	14,291,532	61,865,273	3,834	5,945	132,447	43,308	57,249,011	597.6	1,217.5	5,830.1	562.8	304.4	2,498.6	7,645.3	3,365.8	557.2	1,100.5	1,109.2	57,573,757
2040 No Build	2040	57,349,183	18,063,785	75,412,968	1,394	2,212	61,619	14,008	51,982,015	187.8	1,533.5	7,100.2	175.0	383.4	3,043.0	8,821.6	3,601.3	469.8	330.0	936.3	52,239,369
2040 Build	2040	57,340,789	18,062,931	75,403,720	1,394	2,212	61,609	14,009	51,980,139	187.8	1,533.5	7,099.7	175.0	383.4	3,042.7	8,820.9	3,601.0	469.7	330.0	936.3	52,237,491

tons/year MT/year MT/year

Summary (tons/year)	Year	VMT(million miles per year)			tons/year ROG_RUNEX	tons/year TOG_RUNEX	tons/year CO_RUNEX	tons/year NOx_RUNEX	MT/year CO2_RUNEX	tons/year PM10_RUNEX	tons/year PM10_TW	tons/year PM10_BW	tons/year PM2_5_RUNEX	tons/year PM25_TW	tons/year PM25_BW	tons/year PM10_Total	tons/year PM25_Total	tons/year SOx	MT/year CH4	MT/year N2O	MT/year GHG (CO2e)
Existing	2014	14,955	4,506	19,461	1,407	1,823	37,958	12,016	8,744,576	210.8	186.8	908.9	200.2	46.7	389.5	1,306.4	636.4	96.2	338.9	231.7	8,808,881
2020 No Build	2020	16,587	4,983	21,570	669	1,037	23,092	7,552	9,054,445	104.2	212.2	1,016.4	98.1	53.1	435.6	1,332.9	586.8	97.1	191.9	193.4	9,105,807
2020 Build	2020	16,594	4,985	21,579	669	1,037	23,101	7,557	9,056,991	104.2	212.4	1,016.8	98.1	53.1	435.8	1,333.4	587.0	97.2	191.9	193.4	9,108,369
2020 Build (Assignment Only with No Build Trip Dist)	2020	16,582	4,981	21,563	668	1,036	23,082	7,547	9,050,935	104.1	212.2	1,016.0	98.1	53.0	435.4	1,332.4	586.6	97.1	191.8	193.3	9,102,277
2040 No Build	2040	19,989	6,296	26,285	243	385	10,739	2,441	8,218,235	32.7	267.3	1,237.4	30.5	66.8	530.3	1,537.4	627.6	81.9	57.5	163.2	8,258,923
2040 Build	2040	19,986	6,296	26,282	243	385	10,737	2,441	8,217,939	32.7	267.2	1,237.3	30.5	66.8	530.3	1,537.3	627.6	81.9	57.5	163.2	8,258,626

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2014	LDA	Aggregated	5	DSL	42.57367583	0.356099882	0.40539604	3.252802629	0.389057477	800.1005765	0.170252632	0.00800	0.03675	0.162887578	0.00200	0.01575	0.215002632	0.180637578	0.007636099	0.016540159
Sacramento	2014	LDA	Aggregated	5	GAS	6820.09175	0.221534957	0.302238259	2.816042361	0.216053227	1040.70428	0.012672072	0.00800	0.03675	0.011673393	0.00200	0.01575	0.057422072	0.029423393	0.010438142	0.070192948
Sacramento	2014	LDT1	Aggregated	5	DSL	3.345774205	0.708639606	0.806739077	3.866400618	0.931332041	975.7708516	0.459703709	0.00800	0.03675	0.43981713	0.00200	0.01575	0.504453709	0.45756713	0.009312682	0.032914955
Sacramento	2014	LDT1	Aggregated	5	GAS	691.1094515	0.600009303	0.782419371	7.907864062	0.546409058	1205.605413	0.025420208	0.00800	0.03675	0.023470451	0.00200	0.01575	0.070170208	0.041220451	0.012177628	0.156868053
Sacramento	2014	LDT2	Aggregated	5	DSL	2.296526536	0.299848702	0.341357812	2.052475544	0.236764576	991.7622183	0.067042978	0.00800	0.03675	0.064142728	0.00200	0.01575	0.111792978	0.081892728	0.009465303	0.013927399
Sacramento	2014	LDT2	Aggregated	5	GAS	2595.16845	0.262254333	0.36114242	3.532228643	0.38191171	1410.346253	0.011789131	0.00800	0.03675	0.010862184	0.00200	0.01575	0.056539131	0.028612184	0.014139732	0.086174916
Sacramento	2014	HHDT	Aggregated	5	DSL	3446.203958	2.592110748	2.950920772	5.159823856	23.1277513	3605.393079	0.381638073	0.03600	0.06174	0.365128579	0.00900	0.02646	0.479378073	0.400588579	0.034397135	0.120396831
Sacramento	2014	HHDT	Aggregated	5	GAS	41.03626744	12.13826378	15.05716574	258.9698327	8.227449731	4415.07316	0.026272496	0.02000	0.06174	0.024868771	0.00500	0.02646	0.108012496	0.056328771	0.048561219	2.464546181
Sacramento	2014	LHDT1	Aggregated	5	DSL	8681.719559	0.782754702	0.891114187	3.120134084	4.0832683	1303.696475	0.152165768	0.01200	0.07644	0.145583144	0.00300	0.03276	0.240605768	0.181343144	0.012442379	0.03635746
Sacramento	2014	LHDT1	Aggregated	5	GAS	17630.34656	0.453718115	0.654121173	5.216551098	0.785069514	1407.428767	0.011393042	0.00800	0.07644	0.01048296	0.00200	0.03276	0.095833042	0.04524296	0.014145584	0.176037707
Sacramento	2014	LHDT2	Aggregated	5	DSL	2622.53684	0.763362606	0.869037576	2.947508219	3.492779607	1374.682288	0.122558904	0.01200	0.08918	0.11725706	0.00300	0.03822	0.223738904	0.15847706	0.013119862	0.035456734
Sacramento	2014	LHDT2	Aggregated	5	GAS	2374.359756	0.394963256	0.572589884	4.944641395	0.669146069	1500.492703	0.009276111	0.00800	0.08918	0.008532563	0.00200	0.03822	0.106456111	0.048752563	0.015067613	0.156159781
Sacramento	2014	MDV	Aggregated	5	DSL	13.57472104	0.230320966	0.262205107	3.138459392	0.198416421	1226.310291	0.058001464	0.00800	0.03675	0.055492346	0.00200	0.01575	0.102751464	0.073242346	0.011703811	0.010697969
Sacramento	2014	MDV	Aggregated	5	GAS	1936.413428	0.398239186	0.559284485	4.818482461	0.590017011	1816.877395	0.0121728	0.00800	0.03675	0.011211478	0.00200	0.01575	0.0569228	0.028961478	0.018222446	0.140860226
Sacramento	2014	MH	Aggregated	5	DSL	69.28451409	1.265877511	1.441117385	2.546896688	17.82258284	2119.553872	0.54393311	0.01600	0.13034	0.520402805	0.00400	0.05586	0.69027311	0.580262805	0.02022886	0.058797591
Sacramento	2014	MH	Aggregated	5	GAS	327.1090165	1.689126122	2.177017717	30.52241676	1.518433768	3956.2635	0.020072098	0.01200	0.13034	0.01863617	0.00300	0.05586	0.162412098	0.07749617	0.040021852	0.418058354
Sacramento	2014	MHDT	Aggregated	5	DSL	4026.118553	3.572750398	4.067304365	4.588503969	17.26256657	2352.741981	0.704730549	0.01200	0.13034	0.674244217	0.00300	0.05586	0.847070549	0.733104217	0.022446258	0.165945002
Sacramento	2014	MHDT	Aggregated	5	GAS	1024.30656	1.744439029	2.372990107	21.12048621	2.230964474	3955.080021	0.0115307	0.01200	0.13034	0.010710323	0.00300	0.05586	0.1538707	0.069570323	0.039868239	0.546349687
Sacramento	2014	OBUS	Aggregated	5	DSL	272.1770086	3.081874277	3.508479268	4.63873907	20.14115548	2823.52882	0.587042883	0.01200	0.13034	0.561647668	0.00300	0.05586	0.729382883	0.620507668	0.026937785	0.143145078
Sacramento	2014	OBUS	Aggregated	5	GAS	365.9995441	0.826745374	1.189985849	7.075626825	1.597058835	3951.430003	0.00487126	0.01200	0.13034	0.004489237	0.00300	0.05586	0.14721126	0.063349237	0.039576854	0.318998662
Sacramento	2014	SBUS	Aggregated	5	DSL	143.0870497	1.351907704	1.539044012	1.652596329	22.842753	2403.728389	0.343331911	0.01200	0.74480	0.328479525	0.00300	0.31920	1.100131911	0.650679525	0.022932693	0.062792611
Sacramento	2014	SBUS	Aggregated	5	GAS	65.17541403	3.855311575	5.6256616	33.3187808	3.154663168	1868.626198	0.027387806	0.00800	0.74480	0.025182077	0.00200	0.31920	0.780187806	0.346382077	0.019333866	1.557856579
Sacramento	2014	UBUS	Aggregated	5	DSL	924.2387789	4.405913875	5.015840022	16.40050451	45.66914917	4145.04055	1.218218852	0.01200	0.84182	1.165519243	0.00300	0.36078	2.072038852	1.529299243	0.039559949	0.204646278
Sacramento	2014	UBUS	Aggregated	5	GAS	593.7955469	1.441323803	2.064353415	11.0661263	2.378922656	3955.888509	0.006823876	0.01200	0.13034	0.006293619	0.00300	0.05586	0.149163876	0.065153619	0.039709504	0.546727145
Sacramento	2014	MCY	Aggregated	5	GAS	86.84015633	13.5885291	16.0493229	69.16392812	1.300543697	529.5246646	0.007914618	0.00400	0.01176	0.007489504	0.00100	0.00504	0.023674618	0.013529504	0.006841141	2.017391274
Sacramento	2014	LDA	Aggregated	10	DSL	427.8694255	0.254709827	0.289970204	2.394094592	0.387757817	666.5593028	0.119772037	0.00800	0.03675	0.114590752	0.00200	0.01575	0.164522037	0.132340752	0.006361591	0.011830785
Sacramento	2014	LDA	Aggregated	10	GAS	68542.5602	0.144919547	0.196830027	2.420933488	0.187645077	771.9221105	0.008103411	0.00800	0.03675	0.007466026	0.00200	0.01575	0.052853411	0.025216026	0.007746697	0.045106369
Sacramento	2014	LDT1	Aggregated	10	DSL	33.6253438	0.495442117	0.564027911	2.760670431	0.974923696	821.3712401	0.32034524	0.00800	0.03675	0.306487247	0.00200	0.01575	0.36509524	0.324237247	0.007839104	0.023012339
Sacramento	2014	LDT1	Aggregated	10	GAS	6945.714651	0.404656816	0.525654504	6.441318242	0.466920918	894.2343107	0.016673709	0.00800	0.03675	0.015398741	0.00200	0.01575	0.061423709	0.033148741	0.009039945	0.103935265
Sacramento	2014	LDT2	Aggregated	10	DSL	23.08030656	0.220108236	0.250578593	1.521638303	0.221826482	834.8322373	0.048215656	0.00800	0.03675	0.046129868	0.00200	0.01575	0.092965656	0.063879868	0.007967575	0.010223607
Sacramento	2014	LDT2	Aggregated	10	GAS	26081.68574	0.171796793	0.235691624	3.045796945	0.327702467	1046.096837	0.007559304	0.00800	0.03675	0.006966174	0.00200	0.01575	0.052309304	0.024716174	0.010493606	0.055638241
Sacramento	2014	HHDT	Aggregated	10	DSL	11186.60187	2.015301277	2.294267097	4.303637208	19.172284	3227.266783	0.322178745	0.03600	0.06174	0.308241435	0.00900	0.02646	0.419918745	0.343701435	0.030789634	0.093605525
Sacramento	2014	HHDT	Aggregated	10	GAS	200.5654185	8.169139709	10.07216475	193.2464646	7.537018646	3745.133768	0.018017754	0.02000	0.06174	0.017062437	0.00500	0.02646	0.099757754	0.048522437	0.040698874	1.602206257
Sacramento	2014	LHDT1	Aggregated	10	DSL	28870.67446	0.552221834	0.628667844	2.234837563	4.268709313	1095.960302	0.10685927	0.01200	0.07644	0.102236586	0.00300	0.03276	0.19529927	0.137996586	0.010459761	0.025649649
Sacramento	2014	LHDT1	Aggregated	10	GAS	45972.55454	0.297657699	0.42881181	4.104487977	0.695599251	1384.323429	0.007269701	0.00800	0.07644	0.006689428	0.00200	0.03276	0.091709701	0.041449428	0.01389099	0.115195195
Sacramento	2014	LHDT2	Aggregated	10	DSL	8721.130284	0.543696101	0.618961863	2.123899583	3.629079039	1221.723098	0.086821428	0.01200	0.08918	0.083065572	0.00300	0.03822	0.188001428	0.124285572	0.011660032	0.025253645
Sacramento	2014	LHDT2	Aggregated	10	GAS	6191.335097	0.261305091	0.378692508	3.806799952	0.596890558	1557.44728	0.005944918	0.00800	0.08918	0.005468584	0.00200	0.03822	0.103124918	0.045688584	0.015612447	0.103195539
Sacramento	2014	MDV	Aggregated	10	DSL	136.4272165	0.169103706	0.192513327	2.338673775	0.181207209	1041.435943	0.042002152	0.00800	0.03675	0.040185157	0.00200	0.01575	0.086752152	0.057935157	0.009939385	0.007854544
Sacramento	2014	MDV	Aggregated	10	GAS	19461.13613	0.259046289	0.362806322	4.143599179	0.503613408	1347.633386	0.007818517	0.00800	0.03675	0.00720209	0.00200	0.01575	0.052568517	0.02495209	0.013523554	0.090710642
Sacramento	2014	MH	Aggregated	10	DSL	344.8722107	0.961518848	1.094625282	2.12709457	14.81782542	1924.564026	0.458383469	0.01600	0.13034	0.438554003	0.00400	0.05586	0.604723469	0.498414003	0.018367892	0.044660713
Sacramento	2014	MH	Aggregated	10	GAS	1644.379908	1.145055405	1.470546996	22.369764	1.381938312	3377.317255	0.013225832	0.01200	0.13034	0.012286398	0.00300	0.05586	0.155565832	0.071146398	0.034096007	0.278576199
Sacramento	2014	MHDT	Aggregated	10	DSL	20040.50146	2.725573597	3.102858066	3.83524244	14.38826569	2116.02879	0.592971365	0.01200	0.13034	0.567319686	0.00300	0.05586	0.735311365	0.626179686	0.020187904	0.126595834
Sacramento	2014	MHDT	Aggregated	10	GAS	5149.198102	1.145987717	1.552144498	16.56995937	1.967853232	3376.306963	0.00755373	0.01200	0.13034	0.007020747	0.00300	0.05586	0.14989373	0.065880747	0.033997294	0.352702347
Sacramento	2014	OBUS	Aggregated	10	DSL	1351.480825	2.39204735	2.723163822	3.910284113	16.82790536	2531.607183	0.490401428	0.01200	0.13034	0.469186879	0.00300	0.05586	0.632741428	0.528046879	0.024152716	0.111104404
Sacramento	2014	OBUS	Aggregated	10	GAS	1839.882933	0.525051806	0.754738317	6.175189008	1.390841079	3373.191076	0.003094924	0.01200	0.13034	0.002852834	0.00300	0.05586	0.145434924	0.061712834	0.033779792	0.201670254
Sacramento	2014	SBUS	Aggregated	10	DSL	501.5127755	1.050640673	1.19607443	1.431831179	18.84280454	2170.357146	0.286890381	0.01200	0.74480	0.27447963	0.00300	0.31920	1.043690381	0.59667963	0.020706222	0.048799538
Sacramento	2014	SBUS	Aggregated	10	GAS	228.4364856	2.442199829	3.563652258	30.21342512	2.730965519	1595.177749	0.017303517	0.00800	0.74480	0.015909946	0.00200	0.31920	0.770103517	0.337109946	0.016496159	0.98684555
Sacramento	2014	UBUS	Aggregated	10	DSL	3061.443276	3.465709335	3.945479662	14.58969542	39.19903364	3763.714636	1.036644455	0.01200	0.84182	0.991799675	0.00300	0.36078	1.890464455	1.355579675	0.035920604	0.160975574
Sacramento	2014	UBUS	Aggregated	10	GAS	1966.884993	0.932896672	1.334254454	9.375392259	2.081748847	3376.997139	0.004359433	0.01200	0.13034	0.004021785	0.00300	0.05586	0.146699433	0.062881785	0.033884912	0.352124489
Sacramento	2014	MCY	Aggregated	10	GAS	872.7516963	9.050526525	10.67508144	51.02645486	1.218128421	392.7645965	0.005383143	0.00400	0.01176	0.005095225	0.00100	0.00504	0.021143143	0.011135225	0.005033808	1.33039762
Sacramento	2014	LDA	Aggregated	15	DSL	1213.821848	0.162190668	0.184643292	1.365884572	0.376487912	548.2431297	0.087944902	0.00800	0.03675	0.084140444	0.00200	0.01575	0.132694902	0.101890444	0.00523239	0.007533447
Sacramento	2014	LDA	Aggregated	15	GAS	194448.2409	0.099856666	0.135048543	2.124086892	0.166199194	594.2575517	0.005463511	0.00800	0.03675	0.005034596	0.00200	0.01575	0.050213511	0.022784596	0.005967328	0.030550165
Sacramento	2014	LDT1	Aggregated	15	DSL	95.39166516	0.353618227	0.402570842	1.991071376	1.01723326	681.0521272	0.233545375	0.00800	0.03675	0.223442306	0.00200	0.01575	0.278295375	0.241192306	0.006499909	0.016424891
Sacramento	2014	LDT1	Aggregated	15	GAS	19704.28288	0.286511449	0.370857008	5.418023509	0.409671111	688.4185398	0.011507593	0.00800	0.03675	0.010630258	0.00200	0.01575	0.056257593	0.028380258	0.006965534	0.072371899
Sacramento	2014	LDT2	Aggregated	15	DSL	65.4764718	0.121362361	0.13816298	0.814330168	0.193979518	692.2135124	0.035979449	0.00800	0.03675	0.034422994	0.00200	0.01575	0.080729449	0.052172994	0.006606433	0.00563705
Sacramento	2014	LDT2	Aggregated	15	GAS	73991.07791	0.118497943	0.161989218	2.67663225	0.287182868	805.3285905	0.005109491	0.00800	0.03675	0.004709406	0.00200	0.01575	0.049859491	0.022459406	0.008083046	0.037843184
Sacramento	2014	HHDT	Aggregated	15	DSL	11111.18093	1.15929807	1.319772605	3.084960225	13.81961541	2691.390982	0.227187178	0.03600	0.06174	0.217359162	0.00900	0.02646	0.324927178	0.252819162	0.025677128	0.053846393
Sacramento	2014	HHDT	Aggregated	15	GAS	218.7197464	5.780273809	7.088172095	151.5325438	7.028610649	2701.630068	0.012960365	0.02000	0.06174	0.01227774	0.00500	0.02646	0.094700365	0.04373774	0.029544014	1.098170374
Sacramento	2014	LHDT1	Aggregated	15	DSL	62525.61007	0.37720602	0.429423975	1.576458024	4.445782805	715.7537888	0.078360008	0.01200	0.07644	0.074970189	0.00300	0.03276	0.166800008	0.110730189	0.006831099	0.017520499
Sacramento	2014	LHDT1	Aggregated	15	GAS	104685.7056	0.205772729	0.296234891	3.369822249	0.627118294	961.6716867	0.004893562	0.00800	0.07644	0.004503243	0.00200	0.03276	0.089333562	0.039263243	0.009657974	0.079446277
Sacramento	2014	LHDT2	Aggregated	15	DSL	18887.46978	0.353944712	0.402942522	1.434316714	3.747425102	813.2643289	0.064080115	0.01200	0.08918	0.061308038	0.00300	0.03822	0.165260115	0.102528038	0.007761732	0.016440055
Sacramento	2014	LHDT2	Aggregated	15	GAS	14098.50485	0.182057069	0.263760828	3.068682535	0.541910583	1095.600234	0.004019037	0.00800	0.08918	0.003697142	0.00200	0.03822	0.101199037	0.043917142	0.010988766	0.071822645
Sacramento	2014	MDV	Aggregated	15	DSL	387.0300757	0.093131438	0.10602395	1.19367128	0.150911631	883.2076152	0.03149773	0.00800	0.03675	0.030135152	0.00200	0.01575	0.07624773	0.047885152	0.008429266	0.004325777
Sacramento	2014	MDV	Aggregated	15	GAS	55209.25502	0.177489541	0.247924256	3.63517696	0.439518943	1037.463891	0.005292891	0.00800	0.03675	0.004876272	0.00200	0.01575	0.050042891	0.022626272	0.010417055	0.061546933
Sacramento	2014	MH	Aggregated	15	DSL	465.4577837	0.497505325	0.566376736	1.451605642	10.32508438	1580.233896	0.318765752	0.01600	0.13034	0.304976087	0.00400	0.05586	0.465105752	0.364836087	0.015081631	0.023108171
Sacramento	2014	MH	Aggregated	15	GAS	2077.133772	0.815408449	1.043917034	17.25071789	1.280428842	2327.990948	0.009180346	0.01200	0.13034	0.008532584	0.00300	0.05586	0.151520346	0.067392584	0.023532047	0.195364594
Sacramento	2014	MHDT	Aggregated	15	DSL	27047.72117	1.445709453	1.645830163	2.6667401	10.27035298	1756.972722	0.411656963	0.01200	0.13034	0.393848865	0.00300	0.05586	0.553996963	0.452708865	0.016762341	0.06714946
Sacramento	2014	MHDT	Aggregated	15	GAS	6504.320095	0.793238203	1.070017155	13.5715242	1.765748028	2327.294551	0.005214921	0.01200	0.13034	0.004849833	0.00300	0.05586	0.147554921	0.063709833	0.023468116	0.24013081
Sacramento	2014	OBUS	Aggregated	15	DSL	1750.776646	1.358932783	1.54704153	2.838051594	12.28900741	2117.429935	0.335227411	0.01200	0.13034	0.320725622	0.00300	0.05586	0.477567411	0.379585622	0.020201271	0.063118908
Sacramento	2014	OBUS	Aggregated	15	GAS	2324.087614	0.351790593	0.505015676	5.481757595	1.231037416	2325.146765	0.002074481	0.01200	0.13034	0.001912628	0.00300	0.05586	0.144414481	0.060772628	0.02330324	0.134507845
Sacramento	2014	SBUS	Aggregated	15	DSL	1003.025551	0.585669867	0.666740562	1.083958544	13.15427692	1792.869606	0.195506546	0.01200	0.74480	0.187049019	0.00300	0.31920	0.952306546	0.509249019	0.017104814	0.027202848
Sacramento	2014	SBUS	Aggregated	15	GAS	456.8729712	1.631463942	2.380628355	27.49650905	2.404540923	1099.558933	0.011530625	0.00800	0.74480	0.010601984	0.00200	0.31920	0.764330625	0.331801984	0.011473215	0.659242914

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2014	UBUS	Aggregated	15	DSL	5216.156365	1.961728596	2.233297582	11.54033032	29.46188582	3090.335972	0.739054699	0.01200	0.84182	0.70708352	0.00300	0.36078	1.592874699	1.07086352	0.02949393	0.091118544	
Sacramento	2014	UBUS	Aggregated	15	GAS	3351.223182	0.636741087	0.909443139	8.150072081	1.852176852	2327.770291	0.002938005	0.01200	0.13034	0.002711183	0.00300	0.05586	0.145278005	0.061571183	0.023383096	0.239198645	
Sacramento	2014	MCY	Aggregated	15	GAS	2475.907401	6.344381102	7.474011411	39.59440347	1.160384524	302.3664231	0.003844544	0.00400	0.01176	0.00363968	0.00100	0.00504	0.019604544	0.00967968	0.003858231	0.924169202	
Sacramento	2014	LDA	Aggregated	20	DSL	4648.754731	0.105901705	0.12056205	0.757256832	0.373797054	449.737379	0.067424704	0.00800	0.03675	0.064507941	0.00200	0.01575	0.112174704	0.082257941	0.004292259	0.004918932	
Sacramento	2014	LDA	Aggregated	20	GAS	744707.4551	0.072423264	0.097552151	1.89300235	0.150009739	474.8222199	0.00388196	0.00800	0.03675	0.00357778	0.00200	0.01575	0.04863196	0.02132778	0.004770768	0.021794304	
Sacramento	2014	LDT1	Aggregated	20	DSL	365.3357	0.264022922	0.300572544	1.512990332	1.062500493	559.5363175	0.178133723	0.00800	0.03675	0.170427737	0.00200	0.01575	0.222883723	0.188177737	0.005340172	0.01226336	
Sacramento	2014	LDT1	Aggregated	20	GAS	75464.43358	0.21278427	0.274498224	4.679506019	0.368417014	550.058503	0.008347829	0.00800	0.03675	0.007713218	0.00200	0.01575	0.053097829	0.025463218	0.005570439	0.052896412	
Sacramento	2014	LDT2	Aggregated	20	DSL	250.7650183	0.062915904	0.071625573	0.398567369	0.17667843	568.7062476	0.02790045	0.00800	0.03675	0.026693489	0.00200	0.01575	0.07265045	0.044443489	0.005427689	0.002922323	
Sacramento	2014	LDT2	Aggregated	20	GAS	283374.6764	0.085989811	0.11714966	2.387104931	0.256827529	643.4716866	0.003638475	0.00800	0.03675	0.003354147	0.00200	0.01575	0.048388475	0.021104147	0.006462032	0.027093589	
Sacramento	2014	HHDT	Aggregated	20	DSL	38737.23571	0.640964418	0.729689198	2.254510041	10.6907738	2303.579319	0.161207216	0.03600	0.06174	0.154233463	0.00900	0.02646	0.258947216	0.189693463	0.021977224	0.029771137	
Sacramento	2014	HHDT	Aggregated	20	GAS	373.7883073	4.29764627	5.244751207	124.3055403	6.662097566	2182.742313	0.009774653	0.02000	0.06174	0.00926275	0.00500	0.02646	0.091514653	0.04072275	0.02388494	0.793219075	
Sacramento	2014	LHDT1	Aggregated	20	DSL	68548.26431	0.268507132	0.305677519	1.170418469	4.637961374	610.0720214	0.060019504	0.01200	0.07644	0.057423087	0.00300	0.03276	0.148459504	0.093183087	0.005822481	0.012471643	
Sacramento	2014	LHDT1	Aggregated	20	GAS	120963.5199	0.149818886	0.215544643	2.866422238	0.574967333	834.9428467	0.003474334	0.00800	0.07644	0.003197413	0.00200	0.03276	0.087914334	0.037957413	0.0083831	0.057716466	
Sacramento	2014	LHDT2	Aggregated	20	DSL	20706.76751	0.237827972	0.270751334	1.014077365	3.88709489	693.6546431	0.049309233	0.01200	0.08918	0.047176137	0.00300	0.03822	0.150489233	0.088396137	0.006620187	0.011046655	
Sacramento	2014	LHDT2	Aggregated	20	GAS	16290.71288	0.133501308	0.193359138	2.573713839	0.500375741	958.83619	0.002865319	0.00800	0.08918	0.002635916	0.00200	0.03822	0.100045319	0.042855916	0.009614185	0.05261652	
Sacramento	2014	MDV	Aggregated	20	DSL	1482.266856	0.048172	0.05484062	0.523525111	0.131219389	733.5004274	0.024508704	0.00800	0.03675	0.023448468	0.00200	0.01575	0.069258704	0.041198468	0.007000472	0.002237497	
Sacramento	2014	MDV	Aggregated	20	GAS	211443.1255	0.127991039	0.178326944	3.238762301	0.391832653	828.9518686	0.003774158	0.00800	0.03675	0.003477559	0.00200	0.01575	0.048524158	0.021227559	0.008328072	0.04396362	
Sacramento	2014	MH	Aggregated	20	DSL	493.6348952	0.226430206	0.257775736	0.994937125	7.854708413	1296.769847	0.221123455	0.01600	0.13034	0.211557752	0.00400	0.05586	0.367463455	0.271417752	0.012376272	0.01051725	
Sacramento	2014	MH	Aggregated	20	GAS	2154.497838	0.60966382	0.778380133	13.95529004	1.206180132	1636.772603	0.006709003	0.01200	0.13034	0.006238504	0.00300	0.05586	0.149049003	0.065098504	0.016574949	0.144107855	
Sacramento	2014	MHDT	Aggregated	20	DSL	28685.09126	0.699921198	0.796807006	1.880932648	7.967227079	1485.426983	0.285415868	0.01200	0.13034	0.273068904	0.00300	0.05586	0.427755868	0.331928904	0.014171668	0.032509527	
Sacramento	2014	MHDT	Aggregated	20	GAS	6746.577312	0.578217488	0.777051318	11.52316447	1.611096466	1636.282978	0.003792166	0.01200	0.13034	0.003528612	0.00300	0.05586	0.146132166	0.062388612	0.016531847	0.172355848	
Sacramento	2014	OBUS	Aggregated	20	DSL	1864.300874	0.727362044	0.82804632	2.085198275	9.73462511	1817.65207	0.228216035	0.01200	0.13034	0.218343511	0.00300	0.05586	0.370556035	0.277203511	0.01734125	0.033784083	
Sacramento	2014	OBUS	Aggregated	20	GAS	2410.649621	0.248630908	0.35646203	4.92823451	1.107317368	1634.772904	0.001466742	0.01200	0.13034	0.001352595	0.00300	0.05586	0.143806742	0.060212595	0.016401014	0.094639912	
Sacramento	2014	SBUS	Aggregated	20	DSL	1361.444051	0.293645219	0.334292729	0.825347569	10.21690713	1495.867991	0.132219338	0.01200	0.74480	0.126499588	0.00300	0.31920	0.889019338	0.448699588	0.01427128	0.01363906	
Sacramento	2014	SBUS	Aggregated	20	GAS	620.1307518	1.148998344	1.676615687	25.11119228	2.152929119	773.082017	0.008102764	0.00800	0.74480	0.007450192	0.00200	0.31920	0.760902764	0.328650192	0.008157333	0.46428793	
Sacramento	2014	UBUS	Aggregated	20	DSL	45696.10158	0.95965231	1.092500353	9.253969315	23.99551564	2535.988196	0.528876991	0.01200	0.84182	0.505998007	0.00300	0.36078	1.382696991	0.869778007	0.024203277	0.044574015	
Sacramento	2014	UBUS	Aggregated	20	GAS	29358.36739	0.45811308	0.653469235	7.224307135	1.675170752	1636.617463	0.00208832	0.01200	0.13034	0.001927601	0.00300	0.05586	0.14442832	0.060787601	0.016464116	0.17131982	
Sacramento	2014	MCY	Aggregated	20	GAS	9482.352174	4.67803922	5.504903584	32.1985006	1.121909385	241.5960821	0.00288174	0.00400	0.01176	0.002728675	0.00100	0.00504	0.01864174	0.008768675	0.003077863	0.67585812	
Sacramento	2014	LDA	Aggregated	25	DSL	13161.33362	0.080834104	0.092024253	0.556970069	0.381394777	376.9886052	0.053999916	0.00800	0.03675	0.051663903	0.00200	0.01575	0.098749916	0.069413903	0.00359795	0.00375459	
Sacramento	2014	LDA	Aggregated	25	GAS	2108380.38	0.055251868	0.074139856	1.708415296	0.137887306	393.7702623	0.002905404	0.00800	0.03675	0.00267816	0.00200	0.01575	0.047655404	0.02042816	0.003958374	0.016366901	
Sacramento	2014	LDT1	Aggregated	25	DSL	1034.321084	0.209476254	0.238474788	1.24270797	1.111043732	469.1510321	0.142156149	0.00800	0.03675	0.136006537	0.00200	0.01575	0.186906149	0.153756537	0.004477542	0.009729772	
Sacramento	2014	LDT1	Aggregated	25	GAS	213651.3205	0.165642527	0.212990533	4.133414226	0.339029924	456.1637429	0.006359097	0.00800	0.03675	0.005877026	0.00200	0.01575	0.051109097	0.023627026	0.004623101	0.040540031	
Sacramento	2014	LDT2	Aggregated	25	DSL	709.9540107	0.044105706	0.050211414	0.276354639	0.172106775	476.8396879	0.022520682	0.00800	0.03675	0.021546448	0.00200	0.01575	0.067270682	0.039296448	0.004550921	0.002048626	
Sacramento	2014	LDT2	Aggregated	25	GAS	802276.926	0.065599671	0.089080727	2.154589824	0.234226333	533.6313345	0.002728168	0.00800	0.03675	0.002515393	0.00200	0.01575	0.047478168	0.020265393	0.005361473	0.020402454	
Sacramento	2014	HHDT	Aggregated	25	DSL	23668.41614	0.464514539	0.528814443	1.766376777	9.353566597	2095.95158	0.133805208	0.03600	0.06174	0.128016854	0.00900	0.02646	0.231545208	0.163476854	0.019996358	0.021575497	
Sacramento	2014	HHDT	Aggregated	25	GAS	487.8175861	3.355955887	4.07825513	106.2496729	6.408290651	2053.460569	0.007727428	0.02000	0.06174	0.00732471	0.00500	0.02646	0.089467428	0.03878471	0.022277425	0.603529548	
Sacramento	2014	LHDT1	Aggregated	25	DSL	73364.93033	0.210279467	0.239389193	0.954960879	4.847099646	541.0757809	0.048037652	0.01200	0.07644	0.045959565	0.00300	0.03276	0.136477652	0.081719565	0.005163986	0.009767079	
Sacramento	2014	LHDT1	Aggregated	25	GAS	93179.2029	0.114825302	0.165103242	2.51219955	0.535762646	765.3642761	0.002601106	0.00800	0.07644	0.002393928	0.00200	0.03276	0.087041106	0.037153928	0.00768175	0.04414717	
Sacramento	2014	LHDT2	Aggregated	25	DSL	22161.76545	0.183145327	0.208498779	0.815354158	4.051478839	618.154818	0.039591799	0.01200	0.08918	0.037879076	0.00300	0.03822	0.140771799	0.079099076	0.005899622	0.00850675	
Sacramento	2014	LHDT2	Aggregated	25	GAS	12548.87128	0.102980577	0.149115792	2.234205052	0.469503532	867.032725	0.002153649	0.00800	0.08918	0.001981287	0.00200	0.03822	0.099333649	0.042201287	0.008691466	0.040552473	
Sacramento	2014	MDV	Aggregated	25	DSL	4196.523529	0.033737019	0.038407353	0.34116498	0.124339415	620.2500873	0.019828819	0.00800	0.03675	0.018971033	0.00200	0.01575	0.064578819	0.036721033	0.005919619	0.00156702	
Sacramento	2014	MDV	Aggregated	25	GAS	598627.7353	0.097069097	0.134912442	2.921887437	0.356562089	687.4501258	0.002833003	0.00800	0.03675	0.002610712	0.00200	0.01575	0.047583003	0.020360712	0.006909795	0.033037387	
Sacramento	2014	MH	Aggregated	25	DSL	514.1011664	0.160841355	0.183107189	0.800384303	7.146002445	1163.149848	0.181463663	0.01600	0.13034	0.173613626	0.00400	0.05586	0.327803663	0.233473626	0.011101013	0.007470774	
Sacramento	2014	MH	Aggregated	25	GAS	2400.608729	0.478399787	0.609341934	11.80901052	1.153575026	1429.250009	0.005159373	0.01200	0.13034	0.004799552	0.00300	0.05586	0.147499373	0.063659552	0.014465475	0.111749156	
Sacramento	2014	MHDT	Aggregated	25	DSL	29874.38493	0.508169393	0.578512172	1.519616969	7.18937142	1345.850941	0.234210785	0.01200	0.13034	0.22407893	0.00300	0.05586	0.376550785	0.28293893	0.012840047	0.023603152	
Sacramento	2014	MHDT	Aggregated	25	GAS	7517.24699	0.443633557	0.594155474	10.08685481	1.494058091	1428.822462	0.002903137	0.01200	0.13034	0.002702716	0.00300	0.05586	0.145243137	0.061562716	0.014433729	0.130371162	
Sacramento	2014	OBUS	Aggregated	25	DSL	1921.278169	0.522945308	0.595333425	1.643600365	8.854090142	1647.531242	0.184553027	0.01200	0.13034	0.176569345	0.00300	0.05586	0.326893027	0.235429345	0.015718218	0.024289455	
Sacramento	2014	OBUS	Aggregated	25	GAS	2686.021039	0.185330833	0.265377105	4.474995315	1.012183217	1427.503847	0.001093739	0.01200	0.13034	0.001008827	0.00300	0.05586	0.143433739	0.059868827	0.014322916	0.070240287	
Sacramento	2014	SBUS	Aggregated	25	DSL	2149.130926	0.209427746	0.238417547	0.66821215	9.492566549	1348.150546	0.106611023	0.01200	0.74480	0.101999078	0.00300	0.31920	0.863411023	0.424199078	0.012861986	0.009727376	
Sacramento	2014	SBUS	Aggregated	25	GAS	978.9180654	0.852866573	1.244500901	23.01043363	1.960079043	675.0647448	0.006003388	0.00800	0.74480	0.005519893	0.00200	0.31920	0.758803388	0.326719893	0.007133648	0.344626829	
Sacramento	2014	UBUS	Aggregated	25	DSL	551.9395718	0.684372679	0.779112795	7.823724062	22.03465987	2274.678342	0.441422429	0.01200	0.84182	0.42232669	0.00300	0.36078	1.295242429	0.78610669	0.021709356	0.031787803	
Sacramento	2014	UBUS	Aggregated	25	GAS	354.6045323	0.347288254	0.494789837	6.502802972	1.539815958	1429.114538	0.001565159	0.01200	0.13034	0.001445063	0.00300	0.05586	0.143905159	0.060305063	0.014377501	0.129328114	
Sacramento	2014	MCY	Aggregated	25	GAS	26845.98515	3.626369884	4.26317015	27.35008798	1.09876708	200.3557303	0.002266208	0.00400	0.01176	0.002146173	0.00100	0.00504	0.018026208	0.008186173	0.002553744	0.520079437	
Sacramento	2014	LDA	Aggregated	30	DSL	8358.25921	0.06659776	0.075817122	0.464525457	0.393321972	326.5413073	0.045235487	0.00800	0.03675	0.04327862	0.00200	0.01575	0.089985487	0.06102862	0.003116485	0.003093339	
Sacramento	2014	LDA	Aggregated	30	GAS	1338951.678	0.044314067	0.059250794	1.558520338	0.128990907	338.9321615	0.00228962	0.00800	0.03675	0.002110854	0.00200	0.01575	0.04703962	0.019860854	0.003408361	0.012931874	
Sacramento	2014	LDT1	Aggregated	30	DSL	656.8577299	0.174589044	0.198758019	1.081788597	1.161394186	405.6828734	0.118708658	0.00800	0.03675	0.113573374	0.00200	0.01575	0.163458658	0.131323374	0.003871806	0.008109327	
Sacramento	2014	LDT1	Aggregated	30	GAS	135681.7758	0.135085394	0.173146273	3.724470153	0.318751518	392.6364638	0.005083076	0.00800	0.03675	0.004698802	0.00200	0.01575	0.049833076	0.022448802	0.003981584	0.032553491	
Sacramento	2014	LDT2	Aggregated	30	DSL	450.8646175	0.035349607	0.040243178	0.224622754	0.172761862	412.3313848	0.0189945	0.00800	0.03675	0.018172806	0.00200	0.01575	0.0637445	0.035922806	0.003935259	0.001641922	
Sacramento	2014	LDT2	Aggregated	30	GAS	509495.3672	0.052578422	0.071177661	1.965005552	0.217709731	459.3155932	0.002152927	0.00800	0.03675	0.001985333	0.00200	0.01575	0.046902927	0.019735333	0.004616384	0.016149589	
Sacramento	2014	HHDT	Aggregated	30	DSL	38808.6939	0.363356659	0.413653897	1.425213003	8.579497627	1961.637555	0.117860656	0.03600	0.06174	0.112762056	0.00900	0.02646	0.215600656	0.148222056	0.018714939	0.016876976	
Sacramento	2014	HHDT	Aggregated	30	GAS	890.8463937	2.751210031	3.331094879	94.34543192	6.245666417	1955.11314	0.006402021	0.02000	0.06174	0.006069758	0.00500	0.02646	0.088142021	0.037529758	0.021087389	0.483508476	
Sacramento	2014	LHDT1	Aggregated	30	DSL	61929.29599	0.174589966	0.198759068	0.829310033	5.065201883	491.3553037	0.040217761	0.01200	0.07644	0.038477958	0.00300	0.03276	0.128657761	0.074237958	0.004689457	0.00810937	
Sacramento	2014	LHDT1	Aggregated	30	GAS	82400.99574	0.092597616	0.133073402	2.260111766	0.507014275	694.6163178	0.002052986	0.00800	0.07644	0.00188957	0.00200	0.03276	0.086492986	0.03664957	0.00697087	0.035537415	
Sacramento	2014	LHDT2	Aggregated	30	DSL	18707.33777	0.151296973	0.172241545	0.704281673	4.227620707	557.4770444	0.033239731	0.01200	0.08918	0.031801794	0.00300	0.03822	0.134419731	0.073021794	0.005320518	0.007027455	
Sacramento	2014	LHDT2	Aggregated	30	GAS	11097.32061	0.083523837	0.120915112	2.000117793	0.447245693	783.6641938	0.001706101	0.00800	0.08918	0.001569603	0.00200	0.03822	0.098886101	0.041789603	0.007855041	0.032865524	
Sacramento	2014	MDV	Aggregated	30	DSL	2665.051464	0.027030352	0.030772258	0.269216665	0.122699019	535.7029175	0.016757601	0.00800	0.03675	0.016032675	0.00200	0.01575	0.061507601	0.033782675	0.005112708	0.001255508	
Sacramento	2014	MDV	Aggregated	30	GAS	380165.5612	0.077376969	0.107289843	2.664530552	0.330972207	591.7129334	0.002237444	0.00800	0.03675	0.002062148	0.00200	0.01575	0.046987444	0.019812148	0.005949594	0.026102368	
Sacramento	2014	MH	Aggregated	30	DSL	618.1650022	0.131125637	0.14927782	0.680820409	6.762868082	1091.792016	0.159974026	0.01600	0.13034	0.153053621	0.00400	0.05586	0.306314026	0.212913621	0.010419979	0.006090535	
Sacramento	2014	MH	Aggregated	30	GAS	2714.230124	0.393840269	0.500615242	10.4295561	1.118473474	1313.422487	0.004173211	0.01200	0.13034	0.003883609	0.00300	0.05586	0.146513211	0.062743609	0.013284816	0.091057113	
Sacramento	2014	MHDT	Aggregated	30	DSL	35921.52758	0.412955832	0.470118779	1.28995964	6.748950405	1262.091597	0.206138594	0.01200	0.13034	0.19722113	0.00300	0.05586	0.348478594	0.25608113	0.012040944	0.019180729	
Sacramento	2014	MHDT	Aggregated	30	GAS	8499.318517	0.358096707	0.478129592	9.069005453	1.407393259	1313.029589	0.002338781	0.01200	0.13034	0.002178294	0.00300	0.05586	0.144678781	0.061038294	0.013258877	0.103886003	
Sacramento	2014	OBUS	Aggregated	30	DSL	2369.48037	0.411350029	0.468290696	1.334060862	8.361642199	1539.078961	0.158803686	0.01200	0.13034	0.151933909	0.00300	0.05586	0.301143686	0.210793909	0.014683533	0.019106143	

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2014	OBUS	Aggregated	30	GAS	3036.929396	0.145677561	0.208350758	4.097782752	0.940122019	1311.817835	0.000860036	0.01200	0.13034	0.000793421	0.00300	0.05586	0.143200036	0.059653421	0.013160909	0.054985219	
Sacramento	2014	SBUS	Aggregated	30	DSL	2578.392076	0.16980664	0.193311933	0.553926253	9.113324604	1264.339306	0.091412216	0.01200	0.74480	0.087457764	0.00300	0.31920	0.848212216	0.409657764	0.012062388	0.007887079	
Sacramento	2014	SBUS	Aggregated	30	GAS	1174.444308	0.667042311	0.973346574	21.15544637	1.814361818	620.3569778	0.004688926	0.00800	0.74480	0.004311294	0.00200	0.31920	0.757488926	0.325511294	0.006550707	0.269538851	
Sacramento	2014	UBUS	Aggregated	30	DSL	576.9230716	0.578847972	0.658979931	6.702994887	20.78410312	2135.129585	0.387792533	0.01200	0.84182	0.371016799	0.00300	0.36078	1.241612533	0.734796799	0.020377513	0.026886382	
Sacramento	2014	UBUS	Aggregated	30	GAS	370.6556776	0.277298577	0.394639285	5.929245549	1.438085508	1313.297995	0.001236605	0.01200	0.13034	0.001141986	0.00300	0.05586	0.143576605	0.060001986	0.01320985	0.102864913	
Sacramento	2014	MCY	Aggregated	30	GAS	17048.85759	2.954007797	3.469755081	24.20470903	1.088049449	172.4533497	0.001869119	0.00400	0.01176	0.001770353	0.00100	0.00504	0.017629119	0.007810353	0.002202627	0.420908868	
Sacramento	2014	LDA	Aggregated	35	DSL	15037.80516	0.057519435	0.065482053	0.409779219	0.406996891	295.1867643	0.039598719	0.00800	0.03675	0.037885696	0.00200	0.01575	0.084348719	0.055635696	0.00281724	0.002671668	
Sacramento	2014	LDA	Aggregated	35	GAS	2408981.816	0.037348095	0.049770554	1.435917681	0.122736875	302.786543	0.001899253	0.00800	0.03675	0.001751214	0.00200	0.01575	0.046649253	0.019501214	0.003045466	0.010746204	
Sacramento	2014	LDT1	Aggregated	35	DSL	1181.788972	0.152305256	0.173389409	0.992182156	1.212849013	366.1443848	0.103718525	0.00800	0.03675	0.099231708	0.00200	0.01575	0.148468525	0.116981708	0.003494454	0.007074288	
Sacramento	2014	LDT1	Aggregated	35	GAS	244112.5666	0.115369681	0.147408493	3.4192231	0.305765912	350.7635186	0.004261178	0.00800	0.03675	0.003939923	0.00200	0.01575	0.049011178	0.021689923	0.003558194	0.027372993	
Sacramento	2014	LDT2	Aggregated	35	DSL	811.1754018	0.02978404	0.033907149	0.19325094	0.175413341	372.1449218	0.016695719	0.00800	0.03675	0.015973469	0.00200	0.01575	0.061445719	0.033723469	0.003551723	0.001383412	
Sacramento	2014	LDT2	Aggregated	35	GAS	916661.2174	0.044254676	0.059732866	1.809367106	0.2061406	410.3316133	0.001787452	0.00800	0.03675	0.001648559	0.00200	0.01575	0.046537452	0.019398559	0.004124799	0.013430626	
Sacramento	2014	HHDT	Aggregated	35	DSL	71354.8195	0.286615936	0.326290426	1.16068384	8.02403573	1853.693669	0.106588292	0.03600	0.06174	0.10197733	0.00900	0.02646	0.204328292	0.13743733	0.017685104	0.013312568	
Sacramento	2014	HHDT	Aggregated	35	GAS	1584.489807	2.367008135	2.856899868	86.88950103	6.158682059	1875.109418	0.005557324	0.02000	0.06174	0.005269905	0.00500	0.02646	0.087297324	0.036729905	0.02015818	0.407702931	
Sacramento	2014	LHDT1	Aggregated	35	DSL	32682.49365	0.151806656	0.172821786	0.759022059	5.288520517	491.3553037	0.03519402	0.01200	0.07644	0.033671542	0.00300	0.03276	0.12363402	0.069431542	0.004689457	0.007051129	
Sacramento	2014	LHDT1	Aggregated	35	GAS	30790.25887	0.078536824	0.112814518	2.083249192	0.486932882	694.6163178	0.001707897	0.00800	0.07644	0.00157203	0.00200	0.03276	0.086147897	0.03633203	0.006967504	0.030093403	
Sacramento	2014	LHDT2	Aggregated	35	DSL	9872.588378	0.130980264	0.149112323	0.641548548	4.409696598	557.4770444	0.029136737	0.01200	0.08918	0.027876294	0.00300	0.03822	0.130316737	0.069096294	0.005320518	0.006083783	
Sacramento	2014	LHDT2	Aggregated	35	GAS	4146.665598	0.071198302	0.103051461	1.843019185	0.432129075	783.6641938	0.001424119	0.00800	0.08918	0.001310216	0.00200	0.03822	0.098604119	0.041530216	0.007852055	0.027996912	
Sacramento	2014	MDV	Aggregated	35	DSL	4794.841086	0.022767594	0.025919392	0.224685315	0.12304094	486.0763178	0.014747094	0.00800	0.03675	0.014109141	0.00200	0.01575	0.059497094	0.031859141	0.004639075	0.001057511	
Sacramento	2014	MDV	Aggregated	35	GAS	683976.83	0.064798853	0.089646404	2.454053037	0.313219441	528.6093618	0.001858505	0.00800	0.03675	0.001713108	0.00200	0.01575	0.046608505	0.019463108	0.00531607	0.021672865	
Sacramento	2014	MH	Aggregated	35	DSL	728.8979532	0.108309378	0.123303026	0.583647404	6.4752415	1032.573863	0.146564222	0.01600	0.13034	0.140223918	0.00400	0.05586	0.292904222	0.200083918	0.009854806	0.005030764	
Sacramento	2014	MH	Aggregated	35	GAS	3373.376251	0.340053496	0.431497368	9.601972343	1.097889176	1212.607436	0.003548922	0.01200	0.13034	0.003303719	0.00300	0.05586	0.145888922	0.062163719	0.012263782	0.077933149	
Sacramento	2014	MHDT	Aggregated	35	DSL	42356.21208	0.338849296	0.38575413	1.106357258	6.41889249	1194.253926	0.188212481	0.01200	0.13034	0.180070492	0.00300	0.05586	0.330552481	0.238930492	0.011393741	0.015738672	
Sacramento	2014	MHDT	Aggregated	35	GAS	10563.36343	0.303975254	0.404771099	8.358986543	1.345902112	1212.244696	0.001981867	0.01200	0.13034	0.001846601	0.00300	0.05586	0.144321867	0.060706601	0.012239867	0.087177939	
Sacramento	2014	OBUS	Aggregated	35	DSL	2845.650613	0.326745694	0.371975101	1.089870689	7.991826869	1452.914898	0.139987087	0.01200	0.13034	0.133931307	0.00300	0.05586	0.282327087	0.192791307	0.013861487	0.015176491	
Sacramento	2014	OBUS	Aggregated	35	GAS	3774.442487	0.12073266	0.172485083	3.781337235	0.887179453	1211.125954	0.000713008	0.01200	0.13034	0.0006579	0.00300	0.05586	0.143053008	0.0595179	0.012150099	0.045396169	
Sacramento	2014	SBUS	Aggregated	35	DSL	2646.395094	0.139311041	0.158595015	0.460353944	8.835072217	1196.010714	0.080046405	0.01200	0.74480	0.076583633	0.00300	0.31920	0.836846405	0.398783633	0.011410501	0.006470637	
Sacramento	2014	SBUS	Aggregated	35	GAS	1205.419332	0.54960981	0.801989345	19.51372972	1.707539781	572.7399157	0.00386023	0.00800	0.74480	0.003549339	0.00200	0.31920	0.75666023	0.324749339	0.006044785	0.222086657	
Sacramento	2014	UBUS	Aggregated	35	DSL	745.5703558	0.495005456	0.563530802	5.749543131	19.81299304	2019.321418	0.345725047	0.01200	0.84182	0.330769134	0.00300	0.36078	1.199545047	0.694549134	0.019272249	0.022992057	
Sacramento	2014	UBUS	Aggregated	35	GAS	479.0064724	0.233126125	0.331446816	5.469900358	1.364219014	1212.4925	0.001029709	0.01200	0.13034	0.000951124	0.00300	0.05586	0.143369709	0.059811124	0.012194866	0.08617736	
Sacramento	2014	MCY	Aggregated	35	GAS	30673.54006	2.527595015	2.966685	22.28703171	1.087646513	154.0619614	0.001616398	0.00400	0.01176	0.001531158	0.00100	0.00504	0.017376398	0.007571158	0.001974218	0.358120151	
Sacramento	2014	LDA	Aggregated	40	DSL	17397.4303	0.051981566	0.059177557	0.380834617	0.421747173	276.2287579	0.03620571	0.00800	0.03675	0.034639467	0.00200	0.01575	0.08095571	0.052389467	0.002636306	0.002414444	
Sacramento	2014	LDA	Aggregated	40	GAS	2786982.062	0.033066145	0.043928452	1.336017593	0.11872673	280.7481314	0.001657929	0.00800	0.03675	0.001528902	0.00200	0.01575	0.046407929	0.019278902	0.002823808	0.009389225	
Sacramento	2014	LDT1	Aggregated	40	DSL	1367.226869	0.139037339	0.158284767	0.958468765	1.265152481	341.7300705	0.094812481	0.00800	0.03675	0.090710935	0.00200	0.01575	0.139562481	0.108460935	0.003261446	0.006458019	
Sacramento	2014	LDT1	Aggregated	40	GAS	282416.9696	0.103165545	0.131398708	3.198044816	0.298921969	325.2330881	0.003745068	0.00800	0.03675	0.003463495	0.00200	0.01575	0.048495068	0.021213495	0.00329949	0.024094584	
Sacramento	2014	LDT2	Aggregated	40	DSL	938.4592606	0.026228612	0.029859531	0.174897897	0.179241953	347.3304949	0.015271667	0.00800	0.03675	0.014611022	0.00200	0.01575	0.060021667	0.032361022	0.003314896	0.001218269	
Sacramento	2014	LDT2	Aggregated	40	GAS	1060497.158	0.03910346	0.052632237	1.681972337	0.198761853	380.4655007	0.001560905	0.00800	0.03675	0.001439822	0.00200	0.01575	0.046310905	0.019189822	0.003824562	0.011731494	
Sacramento	2014	HHDT	Aggregated	40	DSL	66073.18128	0.2304578	0.262358662	0.958795315	7.621688619	1766.061038	0.099948345	0.03600	0.06174	0.095624624	0.00900	0.02646	0.197688345	0.131084624	0.016849048	0.010704168	
Sacramento	2014	HHDT	Aggregated	40	GAS	1381.237413	2.136559351	2.571907299	82.98833512	6.136206423	1807.265034	0.005053757	0.02000	0.06174	0.004793139	0.00500	0.02646	0.086793757	0.036253139	0.019411621	0.361714687	
Sacramento	2014	LHDT1	Aggregated	40	DSL	17941.62072	0.138126789	0.157248166	0.731758793	5.515769713	477.9038441	0.032177256	0.01200	0.07644	0.030785282	0.00300	0.03276	0.120617256	0.066545282	0.004561078	0.006415725	
Sacramento	2014	LHDT1	Aggregated	40	GAS	9088.582289	0.070032198	0.100558003	1.967135607	0.474242352	692.0057423	0.001497249	0.00800	0.07644	0.001378203	0.00200	0.03276	0.085937249	0.036138203	0.006939274	0.026797859	
Sacramento	2014	LHDT2	Aggregated	40	DSL	5419.728315	0.118652888	0.135078424	0.61569037	4.595959499	537.1153334	0.026643892	0.01200	0.08918	0.025491289	0.00300	0.03822	0.127823892	0.066711289	0.005126188	0.0055112	
Sacramento	2014	LHDT2	Aggregated	40	GAS	1224.001126	0.063763841	0.092275338	1.747798857	0.423102311	765.7634589	0.001252242	0.00800	0.08918	0.001152114	0.00200	0.03822	0.098432242	0.041372114	0.007671616	0.025059177	
Sacramento	2014	MDV	Aggregated	40	DSL	5547.213353	0.020043132	0.022817773	0.196524594	0.124542646	454.6575351	0.013490923	0.00800	0.03675	0.012907312	0.00200	0.01575	0.058240923	0.030657312	0.004339217	0.000930965	
Sacramento	2014	MDV	Aggregated	40	GAS	791301.5961	0.056991318	0.078675204	2.282545542	0.302093965	490.1343669	0.001623174	0.00800	0.03675	0.001496362	0.00200	0.01575	0.046373174	0.019246362	0.00492912	0.018905445	
Sacramento	2014	MH	Aggregated	40	DSL	904.8133396	0.091940205	0.104667811	0.507588086	6.270038007	985.4953872	0.141198532	0.01600	0.13034	0.135090346	0.00400	0.05586	0.287538532	0.194950346	0.009405492	0.004270447	
Sacramento	2014	MH	Aggregated	40	GAS	4199.505705	0.307867542	0.39008931	9.214264262	1.08968551	1128.152388	0.003171865	0.01200	0.13034	0.00295354	0.00300	0.05586	0.145511865	0.06181354	0.011413715	0.070035673	
Sacramento	2014	MHDT	Aggregated	40	DSL	52578.6436	0.284708954	0.324119471	0.965283688	6.178591115	1139.613184	0.180405084	0.01200	0.13034	0.17260084	0.00300	0.05586	0.322745084	0.23146084	0.010872443	0.013223993	
Sacramento	2014	MHDT	Aggregated	40	GAS	13150.2986	0.271254755	0.360356909	7.897390472	1.305877899	1127.814912	0.001765887	0.01200	0.13034	0.001645924	0.00300	0.05586	0.144105887	0.060505924	0.011388807	0.077018335	
Sacramento	2014	OBUS	Aggregated	40	DSL	3780.386929	0.265550716	0.302309276	0.900993372	7.716795893	1383.628318	0.128037428	0.01200	0.13034	0.122498586	0.00300	0.05586	0.270377428	0.181358586	0.013200461	0.012334143	
Sacramento	2014	OBUS	Aggregated	40	GAS	4698.791828	0.105482049	0.150548159	3.516104932	0.850539936	1126.774087	0.000623132	0.01200	0.13034	0.000575063	0.00300	0.05586	0.142963132	0.059435063	0.011303556	0.039524815	
Sacramento	2014	SBUS	Aggregated	40	DSL	1786.456593	0.117302155	0.133539574	0.385648541	8.648007454	1141.529113	0.072503147	0.01200	0.74480	0.069366693	0.00300	0.31920	0.829303147	0.391566693	0.010890721	0.005448381	
Sacramento	2014	SBUS	Aggregated	40	GAS	813.7217747	0.477014775	0.696058839	18.05790832	1.633836981	532.8500258	0.003349519	0.00800	0.74480	0.003079759	0.00200	0.31920	0.756149519	0.324279759	0.0056208	0.192752412	
Sacramento	2014	UBUS	Aggregated	40	DSL	993.315709	0.432792457	0.492705439	4.958753412	19.11752569	1927.253841	0.315208192	0.01200	0.84182	0.301572425	0.00300	0.36078	1.169028192	0.665352425	0.018393563	0.020102382	
Sacramento	2014	UBUS	Aggregated	40	GAS	638.1753916	0.20628953	0.293036742	5.105141271	1.314113201	1128.045457	0.000903467	0.01200	0.13034	0.000834676	0.00300	0.05586	0.143243467	0.059694676	0.01134533	0.076022408	
Sacramento	2014	MCY	Aggregated	40	GAS	35486.61321	2.270957116	2.663776736	21.34885458	1.096041136	142.8485142	0.001465334	0.00400	0.01176	0.00138819	0.00100	0.00504	0.017225334	0.00742819	0.001838691	0.320207466	
Sacramento	2014	LDA	Aggregated	45	DSL	8610.472445	0.049120504	0.055920428	0.372536428	0.437215625	266.81576	0.034567089	0.00800	0.03675	0.033071732	0.00200	0.01575	0.079317089	0.050821732	0.002546469	0.002281554	
Sacramento	2014	LDA	Aggregated	45	GAS	1379354.987	0.030746368	0.040731186	1.256244596	0.116708172	270.1795352	0.001522859	0.00800	0.03675	0.001404514	0.00200	0.01575	0.046272859	0.019154514	0.002717	0.008624415	
Sacramento	2014	LDT1	Aggregated	45	DSL	676.6786291	0.13281031	0.151195708	0.975151564	1.318125339	329.4857623	0.090677462	0.00800	0.03675	0.086754795	0.00200	0.01575	0.135427462	0.104504795	0.003144587	0.006168785	
Sacramento	2014	LDT1	Aggregated	45	GAS	139776.0182	0.096585974	0.122629181	3.051105724	0.29757884	312.9898822	0.003450363	0.00800	0.03675	0.003191653	0.00200	0.01575	0.048200363	0.020941653	0.003174754	0.022200053	
Sacramento	2014	LDT2	Aggregated	45	DSL	464.4696064	0.024082426	0.027416241	0.166229174	0.183825612	334.8855215	0.014526783	0.00800	0.03675	0.013898361	0.00200	0.01575	0.059276783	0.031648361	0.003196122	0.001118583	
Sacramento	2014	LDT2	Aggregated	45	GAS	524869.5584	0.036265971	0.048684086	1.579480616	0.195113321	366.1431035	0.001433511	0.00800	0.03675	0.001322487	0.00200	0.01575	0.046183511	0.019072487	0.003679916	0.010761678	
Sacramento	2014	HHDT	Aggregated	45	DSL	90129.79326	0.191908408	0.218473115	0.809437886	7.339750236	1695.143008	0.097968357	0.03600	0.06174	0.093730289	0.00900	0.02646	0.195708357	0.129190289	0.016172457	0.008913649	
Sacramento	2014	HHDT	Aggregated	45	GAS	1461.496671	2.022841108	2.429672215	82.31825549	6.170666317	1767.517518	0.00481403	0.02000	0.06174	0.004566361	0.00500	0.02646	0.08655403	0.036026361	0.019000289	0.337549185	
Sacramento	2014	LHDT1	Aggregated	45	DSL	19364.90936	0.131480097	0.149681349	0.74303232	5.746081394	466.1575958	0.0307306	0.01200	0.07644	0.029401208	0.00300	0.03276	0.1191706	0.065161208	0.004448972	0.006106999	
Sacramento	2014	LHDT1	Aggregated	45	GAS	11188.84462	0.065634749	0.09421217	1.906034222	0.468080359	688.8278485	0.001382927	0.00800	0.07644	0.001273021	0.00200	0.03276	0.085822927	0.036033021	0.006906419	0.025086115	
Sacramento	2014	LHDT2	Aggregated	45	DSL	5849.669279	0.112411461	0.127972975	0.622373254	4.785343821	516.2997627	0.02540728	0.01200	0.08918	0.024308173	0.00300	0.03822	0.12658728	0.065528173	0.004927525	0.005221298	
Sacramento	2014	LHDT2	Aggregated	45	GAS	1506.853101	0.059977654	0.086783929	1.708697472	0.419454111	747.716295	0.001159657	0.00800	0.08918	0.001066954	0.00200	0.03822	0.098339657	0.041286954	0.007490751	0.023559938	
Sacramento	2014	MDV	Aggregated	45	DSL	2745.470273	0.018396149	0.020942793	0.179547324	0.12678254	437.542223	0.012819113	0.00800	0.03675	0.012264564	0.00200	0.01575	0.057569113	0.030014564	0.004175869	0.000854466	
Sacramento	2014	MDV	Aggregated	45	GAS	391637.1827	0.052633855	0.072511658	2.145492695	0.29687838	471.6835506	0.001490399	0.00800	0.03675	0.00137411	0.00200	0.01575	0.046240399	0.01912411	0.004742671	0.017323777	
Sacramento	2014	MH	Aggregated	45	DSL	740.9221483	0.081799218	0.093122972	0.45202442	6.140614864	950.5565901	0.143856787	0.01600	0.13034	0.137633606	0.00400	0.05586	0.290196787	0.197493606	0.009072039	0.003799417	
Sacramento	2014	MH	Aggregated	45	GAS	3829.662223	0.292200333	0.369796669	9.226545282	1.092411072	1048.223639	0.002978426	0.01200	0.13034	0.002774068	0.00300	0.05586	0.145318426	0.061634068	0.010615707	0.06606606	

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2014	MHDT	Aggregated	45	DSL	43054.93726	0.249659981	0.284218884	0.864182497	6.017756	1096.554309	0.182714282	0.01200	0.13034	0.174810143	0.00300	0.05586	0.325054282	0.233670143	0.010461641	0.011596059
Sacramento	2014	MHDT	Aggregated	45	GAS	11992.17368	0.254377422	0.33726947	7.660805871	1.284817639	1047.910073	0.001653924	0.01200	0.13034	0.001542011	0.00300	0.05586	0.143993924	0.060402011	0.010587055	0.071613945
Sacramento	2014	OBUS	Aggregated	45	DSL	2842.698336	0.225040853	0.25619188	0.760147544	7.521537923	1328.039378	0.122943388	0.01200	0.13034	0.117624911	0.00300	0.05586	0.265283388	0.176484911	0.012670117	0.010452565
Sacramento	2014	OBUS	Aggregated	45	GAS	4284.977048	0.097138878	0.138520226	3.296639072	0.828305879	1046.94299	0.000573998	0.01200	0.13034	0.000529794	0.00300	0.05586	0.142913998	0.059389794	0.010503132	0.036288067
Sacramento	2014	SBUS	Aggregated	45	DSL	857.0988706	0.103290845	0.117588765	0.328471858	8.547289436	1099.930438	0.068784601	0.01200	0.74480	0.06580901	0.00300	0.31920	0.825584601	0.38800901	0.010493851	0.004797592
Sacramento	2014	SBUS	Aggregated	45	GAS	390.4041201	0.436083243	0.636331644	16.76488798	1.589446122	495.0980019	0.003063167	0.00800	0.74480	0.002816469	0.00200	0.31920	0.755863167	0.324016469	0.005222052	0.176212774
Sacramento	2014	UBUS	Aggregated	45	DSL	831.813965	0.392183449	0.446474783	4.328391708	18.69576939	1858.926854	0.296235318	0.01200	0.84182	0.28342031	0.00300	0.36078	1.150055318	0.64720031	0.017741455	0.018216172
Sacramento	2014	UBUS	Aggregated	45	GAS	534.4153908	0.192078615	0.272646802	4.825364976	1.285000712	1048.124284	0.000835094	0.01200	0.13034	0.000771636	0.00300	0.05586	0.143175094	0.059631636	0.010542818	0.070598622
Sacramento	2014	MCY	Aggregated	45	GAS	17563.31251	2.141847455	2.511010939	21.30108654	1.112194448	137.4710669	0.001392263	0.00400	0.01176	0.001319068	0.00100	0.00504	0.017152263	0.007359068	0.001779783	0.300786516
Sacramento	2014	LDA	Aggregated	50	DSL	8789.92503	0.048533531	0.055252198	0.383851143	0.45317658	267.494961	0.034463334	0.00800	0.03675	0.032972466	0.00200	0.01575	0.079213334	0.050722466	0.002552951	0.00225429
Sacramento	2014	LDA	Aggregated	50	GAS	1408102.401	0.030023054	0.039671664	1.195729878	0.116549641	269.863157	0.001471834	0.00800	0.03675	0.001357603	0.00200	0.01575	0.046221834	0.019107603	0.002712863	0.008328403
Sacramento	2014	LDT1	Aggregated	50	DSL	690.7814243	0.132744116	0.15112035	1.04494836	1.371586843	330.0331125	0.090731872	0.00800	0.03675	0.086806852	0.00200	0.01575	0.135481872	0.104556852	0.003149811	0.00616571
Sacramento	2014	LDT1	Aggregated	50	GAS	142689.1183	0.094681004	0.119831296	2.976841033	0.301523838	312.6233734	0.003332598	0.00800	0.03675	0.00308339	0.00200	0.01575	0.048082598	0.02083339	0.00316985	0.021413603
Sacramento	2014	LDT2	Aggregated	50	DSL	474.1497108	0.023045134	0.026235353	0.166082354	0.188918098	335.441842	0.014370787	0.00800	0.03675	0.013749113	0.00200	0.01575	0.059120787	0.031499113	0.003201431	0.001070402
Sacramento	2014	LDT2	Aggregated	50	GAS	535808.4702	0.03530182	0.047272998	1.500541262	0.194982027	365.7143526	0.001384559	0.00800	0.03675	0.001277482	0.00200	0.01575	0.046134559	0.019027482	0.003674359	0.010368221
Sacramento	2014	HHDT	Aggregated	50	DSL	91437.33562	0.16859028	0.191927201	0.705414811	7.16019445	1638.647818	0.100731877	0.03600	0.06174	0.096374261	0.00900	0.02646	0.198471877	0.131834261	0.015633466	0.007830582
Sacramento	2014	HHDT	Aggregated	50	GAS	1529.139405	2.008411895	2.40809606	85.03909451	6.257313891	1745.567389	0.004802926	0.02000	0.06174	0.004556291	0.00500	0.02646	0.086542926	0.036016291	0.018823285	0.331239672
Sacramento	2014	LHDT1	Aggregated	50	DSL	74774.05106	0.130928626	0.149053536	0.794710424	5.978619408	488.703931	0.03065854	0.01200	0.07644	0.029332266	0.00300	0.03276	0.11909854	0.065092266	0.004664153	0.006081384
Sacramento	2014	LHDT1	Aggregated	50	GAS	82616.86928	0.064634514	0.09275107	1.901694372	0.467920289	726.4200063	0.001345561	0.00800	0.07644	0.001238665	0.00200	0.03276	0.085785561	0.035998665	0.007281438	0.024680507
Sacramento	2014	LHDT2	Aggregated	50	DSL	22587.42663	0.111376732	0.126795004	0.662771941	4.976962504	535.315952	0.025266682	0.01200	0.08918	0.024173657	0.00300	0.03822	0.126446682	0.065393657	0.005109014	0.005173236
Sacramento	2014	LHDT2	Aggregated	50	GAS	11126.39329	0.059238243	0.085704248	1.727966357	0.420748111	779.5196887	0.00113079	0.00800	0.08918	0.001040413	0.00200	0.03822	0.09831079	0.041260413	0.007808386	0.023260482
Sacramento	2014	MDV	Aggregated	50	DSL	2802.689171	0.017596171	0.02003207	0.171422762	0.129518179	439.7347352	0.012652509	0.00800	0.03675	0.012105167	0.00200	0.01575	0.057402509	0.029855167	0.004196795	0.000817308
Sacramento	2014	MDV	Aggregated	50	GAS	399799.3719	0.051042596	0.070185422	2.041247051	0.297266686	471.1312126	0.001438747	0.00800	0.03675	0.001326622	0.00200	0.01575	0.046188747	0.019076622	0.004735456	0.016676851
Sacramento	2014	MH	Aggregated	50	DSL	829.2123747	0.077768801	0.088534609	0.416624337	6.083255184	927.7574715	0.154526645	0.01600	0.13034	0.14784189	0.00400	0.05586	0.300866645	0.20770189	0.008854446	0.003612212
Sacramento	2014	MH	Aggregated	50	GAS	3727.048401	0.290687018	0.367531967	9.660709056	1.10516132	980.5642819	0.002937632	0.01200	0.13034	0.002736594	0.00300	0.05586	0.145277632	0.061596594	0.009947281	0.065402649
Sacramento	2014	MHDT	Aggregated	50	DSL	48185.47651	0.233014847	0.265269666	0.801222272	5.930685048	1064.047263	0.195157263	0.01200	0.13034	0.186714846	0.00300	0.05586	0.337497263	0.245574846	0.010151508	0.010822936
Sacramento	2014	MHDT	Aggregated	50	GAS	11670.84958	0.250625401	0.331760676	7.656655819	1.281197207	980.2709554	0.001627852	0.01200	0.13034	0.001518061	0.00300	0.05586	0.143967852	0.060378061	0.009911862	0.07006671
Sacramento	2014	OBUS	Aggregated	50	DSL	3621.497193	0.203101916	0.231216071	0.662110567	7.397212689	1284.139403	0.124734402	0.01200	0.13034	0.119338447	0.00300	0.05586	0.267074402	0.178198447	0.01225129	0.009433558
Sacramento	2014	OBUS	Aggregated	50	GAS	4170.163299	0.094278896	0.134343729	3.121006244	0.819330498	979.3662943	0.000557223	0.01200	0.13034	0.000514372	0.00300	0.05586	0.142897223	0.059374372	0.009825912	0.035129446
Sacramento	2014	SBUS	Aggregated	50	DSL	429.2611492	0.09689355	0.110305931	0.287866052	8.530317183	1070.608437	0.068903009	0.01200	0.74480	0.065922295	0.00300	0.31920	0.825703009	0.388122295	0.010214105	0.004500454
Sacramento	2014	SBUS	Aggregated	50	GAS	195.5262421	0.419942309	0.612778831	15.61509487	1.57217916	463.1410689	0.002952517	0.00800	0.74480	0.002714731	0.00200	0.31920	0.755752517	0.323914731	0.004884437	0.169690536
Sacramento	2014	UBUS	Aggregated	50	DSL	782.8343187	0.373164699	0.4248232	3.857257351	18.54664299	1814.340457	0.288802355	0.01200	0.84182	0.276308893	0.00300	0.36078	1.142622355	0.640088893	0.017315926	0.017332787
Sacramento	2014	UBUS	Aggregated	50	GAS	502.947445	0.18814255	0.266895686	4.629548445	1.275204526	980.47134	0.000813027	0.01200	0.13034	0.00075135	0.00300	0.05586	0.143153027	0.05961135	0.009864474	0.069001131
Sacramento	2014	MCY	Aggregated	50	GAS	17929.35303	2.120027293	2.484374968	22.19095539	1.135439284	137.3100893	0.00138624	0.00400	0.01176	0.001313441	0.00100	0.00504	0.01714624	0.007353441	0.001791348	0.296752598
Sacramento	2014	LDA	Aggregated	55	DSL	13828.42959	0.050158847	0.057102513	0.417246654	0.469480243	279.9124129	0.035891829	0.00800	0.03675	0.034339164	0.00200	0.01575	0.080641829	0.052089164	0.002671463	0.002329783
Sacramento	2014	LDA	Aggregated	55	GAS	2215245.847	0.030786926	0.040589855	1.155405841	0.118230379	279.7636548	0.001496932	0.00800	0.03675	0.001380884	0.00200	0.01575	0.046246932	0.019130884	0.002811054	0.008456504
Sacramento	2014	LDT1	Aggregated	55	DSL	1086.746731	0.13883595	0.158055499	1.179459348	1.42538458	345.0765052	0.094986501	0.00800	0.03675	0.090877427	0.00200	0.01575	0.139736501	0.108627427	0.003293384	0.006448665
Sacramento	2014	LDT1	Aggregated	55	GAS	224480.4614	0.097199189	0.122635583	2.982420569	0.310957463	324.0926197	0.003375477	0.00800	0.03675	0.003123726	0.00200	0.01575	0.048125477	0.020873726	0.003284472	0.021631274
Sacramento	2014	LDT2	Aggregated	55	DSL	745.9387731	0.023005473	0.026190201	0.174893955	0.194365799	350.7317724	0.014796503	0.00800	0.03675	0.014156413	0.00200	0.01575	0.059546503	0.031906413	0.003347357	0.00106856
Sacramento	2014	LDT2	Aggregated	55	GAS	842941.172	0.036070308	0.04819307	1.445873211	0.198385529	379.1313533	0.001406578	0.00800	0.03675	0.001297937	0.00200	0.01575	0.046156578	0.019047937	0.003807416	0.010493725
Sacramento	2014	HHDT	Aggregated	55	DSL	110094.119	0.158527469	0.180471456	0.641726124	7.072426313	1600.408316	0.108372839	0.03600	0.06174	0.103684678	0.00900	0.02646	0.206112839	0.139144678	0.015268643	0.00736319
Sacramento	2014	HHDT	Aggregated	55	GAS	2244.663364	2.09083371	2.503547946	91.84861052	6.393982138	1712.700056	0.005018488	0.02000	0.06174	0.00476115	0.00500	0.02646	0.086758488	0.03622115	0.018604898	0.341733568
Sacramento	2014	LHDT1	Aggregated	55	DSL	45029.61286	0.136417104	0.155301803	0.895439562	6.212690451	510.6782651	0.03195984	0.01200	0.07644	0.030577271	0.00300	0.03276	0.12039984	0.066337271	0.004873874	0.006336314
Sacramento	2014	LHDT1	Aggregated	55	GAS	22723.54051	0.06686433	0.095930561	1.964087062	0.473533955	765.3642761	0.001378932	0.00800	0.07644	0.001269419	0.00200	0.03276	0.085818932	0.036029419	0.007671132	0.025513285
Sacramento	2014	LHDT2	Aggregated	55	DSL	13602.35352	0.115440601	0.131421449	0.743759404	5.170123951	554.0777942	0.026216694	0.01200	0.08918	0.025082572	0.00300	0.03822	0.127396694	0.066302572	0.005288076	0.005361995
Sacramento	2014	LHDT2	Aggregated	55	GAS	3060.283582	0.061421752	0.088855463	1.816667432	0.42679345	815.0107615	0.001160835	0.00800	0.08918	0.001068071	0.00200	0.03822	0.098340835	0.041288071	0.008164032	0.024110665
Sacramento	2014	MDV	Aggregated	55	DSL	4409.228718	0.017557381	0.019987911	0.171603296	0.132600126	464.0737619	0.01298321	0.00800	0.03675	0.012421562	0.00200	0.01575	0.05773321	0.030171562	0.004429084	0.000815507
Sacramento	2014	MDV	Aggregated	55	GAS	628969.8088	0.051983832	0.071354867	1.971167888	0.303340159	488.4156526	0.001460424	0.00800	0.03675	0.001346731	0.00200	0.01575	0.046210424	0.019096731	0.004906872	0.016869676
Sacramento	2014	MH	Aggregated	55	DSL	1215.135593	0.079780627	0.090824939	0.401194929	6.095722356	917.0980312	0.173200089	0.01600	0.13034	0.16570753	0.00400	0.05586	0.319540089	0.22556753	0.008752713	0.003705658
Sacramento	2014	MH	Aggregated	55	GAS	4874.639834	0.303069928	0.382911262	10.6067521	1.127528084	953.5371744	0.003042657	0.01200	0.13034	0.00283485	0.00300	0.05586	0.145382657	0.06169485	0.009692866	0.067934013
Sacramento	2014	MHDT	Aggregated	55	DSL	70611.44931	0.2342153	0.26663629	0.775116298	5.913982812	1042.519796	0.217767577	0.01200	0.13034	0.208347048	0.00300	0.05586	0.360107577	0.267207048	0.009946126	0.010878694
Sacramento	2014	MHDT	Aggregated	55	GAS	15264.40822	0.25937144	0.342910476	7.926234835	1.294360108	953.2519328	0.001683317	0.01200	0.13034	0.001570071	0.00300	0.05586	0.144023317	0.060430071	0.009646796	0.072118787
Sacramento	2014	OBUS	Aggregated	55	DSL	5865.985401	0.198047531	0.225462038	0.603205353	7.338310942	1250.591553	0.133473856	0.01200	0.13034	0.127699836	0.00300	0.05586	0.275813856	0.186559836	0.011931228	0.009198795
Sacramento	2014	OBUS	Aggregated	55	GAS	5454.193761	0.096426369	0.137324022	2.991038349	0.823127619	952.3722067	0.000570016	0.01200	0.13034	0.000526231	0.00300	0.05586	0.142910016	0.059386231	0.009554589	0.035856298
Sacramento	2014	SBUS	Aggregated	55	DSL	638.9277892	0.097799794	0.111337621	0.263159179	8.595665198	1053.166442	0.072879439	0.01200	0.74480	0.069726706	0.00300	0.31920	0.829679439	0.391926706	0.0100477	0.004542547
Sacramento	2014	SBUS	Aggregated	55	GAS	291.0283165	0.426039353	0.621675624	14.59192648	1.581292545	450.3755994	0.002999741	0.00800	0.74480	0.002758151	0.00200	0.31920	0.755799741	0.323958151	0.004741267	0.172154233
Sacramento	2014	UBUS	Aggregated	55	DSL	1321.576304	0.375728218	0.427741597	3.544652672	18.66949577	1793.494649	0.292906659	0.01200	0.84182	0.280235647	0.00300	0.36078	1.146726659	0.644015647	0.017116976	0.017451858
Sacramento	2014	UBUS	Aggregated	55	GAS	849.0729261	0.193825161	0.274824832	4.525989459	1.284009533	953.4467942	0.000833594	0.01200	0.13034	0.000770441	0.00300	0.05586	0.143173594	0.059630441	0.009593406	0.070963801
Sacramento	2014	MCY	Aggregated	55	GAS	28206.70201	2.201832457	2.579398505	24.21592225	1.165457354	142.3475989	0.001446234	0.00400	0.01176	0.001370348	0.00100	0.00504	0.017206234	0.007410348	0.00187617	0.307430662
Sacramento	2014	LDA	Aggregated	60	DSL	13504.70632	0.054437513	0.06197349	0.482414448	0.486415211	303.4586687	0.039113697	0.00800	0.03675	0.037421656	0.00200	0.01575	0.083863697	0.055171656	0.002896186	0.002528518
Sacramento	2014	LDA	Aggregated	60	GAS	2163386.984	0.033156242	0.043630512	1.138557913	0.121841577	301.0191067	0.001602388	0.00800	0.03675	0.00147828	0.00200	0.01575	0.046352388	0.01922828	0.003022986	0.009030943
Sacramento	2014	LDT1	Aggregated	60	DSL	1061.306011	0.1520141	0.173057946	1.402964208	1.479457366	373.788495	0.10405901	0.00800	0.03675	0.099557463	0.00200	0.01575	0.14880901	0.117307463	0.003567409	0.007060764
Sacramento	2014	LDT1	Aggregated	60	GAS	219225.378	0.104528106	0.1314844	3.086501289	0.326535139	348.7160294	0.003586869	0.00800	0.03675	0.003320025	0.00200	0.01575	0.048336869	0.021070025	0.00353208	0.022896447
Sacramento	2014	LDT2	Aggregated	60	DSL	728.4763607	0.024309907	0.027675213	0.197129192	0.20057215	379.9143072	0.01593684	0.00800	0.03675	0.01524742	0.00200	0.01575	0.06068684	0.03299742	0.003625873	0.001129149
Sacramento	2014	LDT2	Aggregated	60	GAS	823207.9352	0.038694225	0.051594982	1.418852198	0.205582576	407.9364111	0.001503351	0.00800	0.03675	0.001387363	0.00200	0.01575	0.046253351	0.019137363	0.004094536	0.011161615
Sacramento	2014	HHDT	Aggregated	60	DSL	33538.51485	0.158826526	0.18081191	0.621912911	7.053310923	1585.123956	0.11375527	0.03600	0.06174	0.108834267	0.00900	0.02646	0.21149527	0.144294267	0.015122824	0.007377081
Sacramento	2014	HHDT	Aggregated	60	GAS	553.9867799	2.281966699	2.729820991	104.1823351	6.580871002	1688.731253	0.005491418	0.02000	0.06174	0.005210109	0.00500	0.02646	0.087231418	0.036670109	0.018565782	0.370594209
Sacramento	2014	MDV	Aggregated	60	DSL	4306.008758	0.018545762	0.021113117	0.185127749	0.136442003	502.4985004	0.013934471	0.00800	0.03675	0.013331672	0.00200	0.01575	0.058684471	0.031081672	0.004795807	0.000861415
Sacramento	2014	MDV	Aggregated	60	GAS	614245.6376	0.05561364	0.07621886	1.940512346	0.315592276	525.5237445	0.00155921	0.00800	0.03675	0.001437938	0.00200	0.01575	0.04630921	0.019187938	0.005276834	0.017938777
Sacramento	2014	MH	Aggregated	60	DSL	1460.189049	0.087977028	0.100155997	0.406138048	6.184848084	918.5782693	0.199924722	0.01600	0.13034	0.191276067	0.00400	0.05586	0.346264722	0.251136067	0.008766841	0.004086365
Sacramento	2014	MH	Aggregated	60	GAS	5625.111934	0.331123109	0.418142471	12.24857714	1.159560052	959.4613336	0.003308882	0.01200	0.13034	0.003083214	0.00300	0.05586	0.145648882	0.061943214	0.009778763	0.074027029
Sacramento	2014	MHDT	Aggregated	60	DSL	84851.48949	0.24156594	0.275004435	0.775182601	5.93001858	1035.186341	0.232808246	0.01200	0.13034	0.222737064	0.00300	0.05586	0.375148246	0.281597064	0.009876162	0.011220112

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2014	MHDT	Aggregated	60	GAS	17614.43056	0.281900531	0.372365676	8.557318203	1.324459168	959.1743198	0.001828495	0.01200	0.13034	0.001705702	0.00300	0.05586	0.144168495	0.060565702	0.009716655	0.078079622
Sacramento	2014	OBUS	Aggregated	60	DSL	6647.008138	0.201926226	0.229877637	0.586474792	7.328010517	1237.133493	0.140294951	0.01200	0.13034	0.134225854	0.00300	0.05586	0.282634951	0.193085854	0.011802832	0.00937895
Sacramento	2014	OBUS	Aggregated	60	GAS	6293.89072	0.103919917	0.14793352	2.913555902	0.839829856	958.2891281	0.000614393	0.01200	0.13034	0.000567238	0.00300	0.05586	0.142954393	0.059427238	0.009612729	0.03858551
Sacramento	2014	SBUS	Aggregated	60	DSL	355.5933203	0.101020927	0.115004635	0.256395054	8.654173702	1048.464885	0.076269911	0.01200	0.74480	0.072970508	0.00300	0.31920	0.833069911	0.395170508	0.010002845	0.00469216
Sacramento	2014	SBUS	Aggregated	60	GAS	161.9709255	0.455446589	0.664586594	13.68129943	1.617439186	453.173704	0.00321292	0.00800	0.74480	0.002954162	0.00200	0.31920	0.75601292	0.324154162	0.004756164	0.184037127
Sacramento	2014	UBUS	Aggregated	60	DSL	2000.389966	0.399890889	0.455249191	3.392035399	19.0663247	1796.389431	0.308563928	0.01200	0.84182	0.295215589	0.00300	0.36078	1.162383928	0.658995589	0.017144603	0.018574167
Sacramento	2014	UBUS	Aggregated	60	GAS	1285.190235	0.209979209	0.297627217	4.5355782	1.311600278	959.3703919	0.000899974	0.01200	0.13034	0.000831859	0.00300	0.05586	0.143239974	0.059691859	0.009653335	0.076783999
Sacramento	2014	MCY	Aggregated	60	GAS	27546.38366	2.399123745	2.809874235	27.78053393	1.202245541	153.1626655	0.001580824	0.00400	0.01176	0.001497925	0.00100	0.00504	0.017340824	0.007537925	0.002046778	0.334383037
Sacramento	2014	LDA	Aggregated	65	DSL	1593.874795	0.061954963	0.070531607	0.591178183	0.503792147	341.1489596	0.04460138	0.00800	0.03675	0.042671944	0.00200	0.01575	0.08935138	0.060421944	0.0032559	0.00287769
Sacramento	2014	LDA	Aggregated	65	GAS	255330.8383	0.037507869	0.049281798	1.152046679	0.12760118	336.1652962	0.001805785	0.00800	0.03675	0.001666023	0.00200	0.01575	0.046555785	0.019416023	0.003374085	0.010147238
Sacramento	2014	LDT1	Aggregated	65	DSL	125.2592141	0.174216738	0.198334174	1.758198947	1.533632902	419.8485989	0.119292893	0.00800	0.03675	0.114132335	0.00200	0.01575	0.164042893	0.131882335	0.004007003	0.008092034
Sacramento	2014	LDT1	Aggregated	65	GAS	25873.78031	0.117794671	0.147748575	3.325326396	0.349481157	389.4311846	0.004001116	0.00800	0.03675	0.003704148	0.00200	0.01575	0.048751116	0.021454148	0.003942597	0.025413041
Sacramento	2014	LDT2	Aggregated	65	DSL	85.9774424	0.027070357	0.030817802	0.236539807	0.207336824	426.7292645	0.01795449	0.00800	0.03675	0.017177787	0.00200	0.01575	0.06270449	0.034927787	0.004072671	0.001257366
Sacramento	2014	LDT2	Aggregated	65	GAS	97158.00904	0.043592848	0.05802726	1.426839279	0.217116243	455.5659804	0.001691001	0.00800	0.03675	0.001560648	0.00200	0.01575	0.046441001	0.019310648	0.004570143	0.012483148
Sacramento	2014	HHDT	Aggregated	65	DSL	18369.71806	0.158826526	0.18081191	0.621912911	7.053310923	1585.123956	0.11375527	0.03600	0.06174	0.108834267	0.00900	0.02646	0.21149527	0.144294267	0.015122824	0.007377081
Sacramento	2014	HHDT	Aggregated	65	GAS	296.9254488	2.610887027	3.121541939	124.6424972	6.820613422	1684.125622	0.006292539	0.02000	0.06174	0.005970379	0.00500	0.02646	0.088032539	0.037430379	0.018852191	0.422400352
Sacramento	2014	MDV	Aggregated	65	DSL	508.2108905	0.02064503	0.023502994	0.213711674	0.140847711	564.2353841	0.015640626	0.00800	0.03675	0.014964019	0.00200	0.01575	0.060390626	0.032714019	0.005385019	0.000958922
Sacramento	2014	MDV	Aggregated	65	GAS	72495.515	0.062521062	0.085572804	1.960427713	0.335011951	586.8824979	0.001751558	0.00800	0.03675	0.001615428	0.00200	0.01575	0.046501558	0.019365428	0.005889716	0.020063231
Sacramento	2014	MH	Aggregated	65	DSL	229.7922397	0.102278506	0.116437279	0.431229242	6.347660644	932.1981857	0.234686342	0.01600	0.13034	0.224533915	0.00400	0.05586	0.381026342	0.284393915	0.008896828	0.004750641
Sacramento	2014	MH	Aggregated	65	GAS	878.994946	0.3790866	0.4785671 44	14.91859755	1.201774645	977.2475304	0.00377775	0.01200	0.13034	0.003520323	0.00300	0.05586	0.14611775	0.062380323	0.009999895	0.084617874
Sacramento	2014	MHDT	Aggregated	65	DSL	13353.21192	0.24156594	0.275004435	0.775182601	5.93001858	1035.186341	0.232808246	0.01200	0.13034	0.222737064	0.00300	0.05586	0.375148246	0.281597064	0.009876162	0.011220112
Sacramento	2014	MHDT	Aggregated	65	GAS	2752.477749	0.321733434	0.42475693	9.710915691	1.372471822	976.9551961	0.002086159	0.01200	0.13034	0.001946214	0.00300	0.05586	0.144426159	0.060806214	0.009913716	0.088906034
Sacramento	2014	OBUS	Aggregated	65	DSL	905.4047548	0.201926226	0.229877637	0.586474792	7.328010517	1237.133493	0.140294951	0.01200	0.13034	0.134225854	0.00300	0.05586	0.282634951	0.193085854	0.011802832	0.00937895
Sacramento	2014	OBUS	Aggregated	65	GAS	983.5000971	0.118004096	0.167940091	2.903020411	0.870198947	976.053595	0.000697715	0.01200	0.13034	0.000644192	0.00300	0.05586	0.143037715	0.059504192	0.00979042	0.043775692
Sacramento	2014	SBUS	Aggregated	65	DSL	0	0.101020927	0.115004635	0.256395054	8.654173702	1048.464885	0.076269911	0.01200	0.74480	0.072970508	0.00300	0.31920	0.833069911	0.395170508	0.010002845	0.00469216
Sacramento	2014	UBUS	Aggregated	65	DSL	301.05448	0.445643372	0.507335351	3.398592949	19.73626396	1823.024803	0.335769477	0.01200	0.84182	0.321244238	0.00300	0.36078	1.189589477	0.685024238	0.017398809	0.020699283
Sacramento	2014	UBUS	Aggregated	65	GAS	193.4184257	0.239185984	0.338955378	4.698801884	1.359076696	977.1549029	0.001023044	0.01200	0.13034	0.000945659	0.00300	0.05586	0.143363044	0.059805659	0.009834574	0.087399921
Sacramento	2014	MCY	Aggregated	65	GAS	3251.124871	2.742229918	3.211284456	33.61675437	1.246127265	171.0455305	0.001810296	0.00400	0.01176	0.001715396	0.00100	0.00504	0.017570296	0.007755396	0.00232857	0.381801006
Sacramento	2014	LDA	Aggregated	70	DSL	527.4937359	0.067196272	0.076498489	0.667306958	0.512462089	368.3869303	0.048427497	0.00800	0.03675	0.046332545	0.00200	0.01575	0.093177497	0.064082545	0.003515857	0.003121138
Sacramento	2014	LDA	Aggregated	70	GAS	84501.88071	0.040638377	0.053362744	1.173853043	0.131396432	360.2396068	0.001954476	0.00800	0.03675	0.001803245	0.00200	0.01575	0.046704476	0.019553245	0.003614783	0.010964516
Sacramento	2014	LDT1	Aggregated	70	DSL	41.45460547	0.189696841	0.215957241	2.006844191	1.560662914	452.9764997	0.129914246	0.00800	0.03675	0.124294214	0.00200	0.01575	0.174664246	0.142044214	0.004323173	0.008811056
Sacramento	2014	LDT1	Aggregated	70	GAS	8562.941757	0.127274666	0.1594243	3.514214133	0.364303125	417.3201054	0.0043044	0.00800	0.03675	0.003985264	0.00200	0.01575	0.0490544	0.021735264	0.004224204	0.027260706
Sacramento	2014	LDT2	Aggregated	70	DSL	28.45428163	0.028994995	0.033008875	0.264125121	0.210711949	460.4000801	0.019361235	0.00800	0.03675	0.018523676	0.00200	0.01575	0.064111235	0.036273676	0.004394023	0.001346762
Sacramento	2014	LDT2	Aggregated	70	GAS	32154.49628	0.047132779	0.06269366	1.447967579	0.224776164	488.1911117	0.001828338	0.00800	0.03675	0.001687445	0.00200	0.01575	0.046578338	0.019437445	0.004896175	0.013454859
Sacramento	2014	HHDT	Aggregated	70	DSL	0	0.158826526	0.18081191	0.621912911	7.053310923	1585.123956	0.11375527	0.03600	0.06174	0.108834267	0.00900	0.02646	0.21149527	0.144294267	0.015122824	0.007377081
Sacramento	2014	MDV	Aggregated	70	DSL	168.1926724	0.02210868	0.025169262	0.233718887	0.143045869	607.4087989	0.016830189	0.00800	0.03675	0.016102123	0.00200	0.01575	0.061580189	0.033852123	0.005797063	0.001026906
Sacramento	2014	MDV	Aggregated	70	GAS	23992.43038	0.067542737	0.092394692	1.995365503	0.347890744	628.9117963	0.001892465	0.00800	0.03675	0.001745428	0.00200	0.01575	0.046642465	0.019495428	0.006309871	0.021627556
Sacramento	2014	MHDT	Aggregated	70	DSL	0	0.24156594	0.275004435	0.775182601	5.93001858	1035.186341	0.232808246	0.01200	0.13034	0.222737064	0.00300	0.05586	0.375148246	0.281597064	0.009876162	0.011220112
Sacramento	2014	OBUS	Aggregated	70	DSL	0	0.201926226	0.229877637	0.586474792	7.328010517	1237.133493	0.140294951	0.01200	0.13034	0.134225854	0.00300	0.05586	0.282634951	0.193085854	0.011802832	0.00937895
Sacramento	2014	SBUS	Aggregated	70	DSL	0	0.101020927	0.115004635	0.256395054	8.654173702	1048.464885	0.076269911	0.01200	0.74480	0.072970508	0.00300	0.31920	0.833069911	0.395170508	0.010002845	0.00469216
Sacramento	2014	MCY	Aggregated	70	GAS	1075.961556	2.984766363	3.495189206	37.75978621	1.270918398	183.2948712	0.001971314	0.00400	0.01176	0.001867982	0.00100	0.00504	0.017731314	0.007907982	0.002524134	0.415461652
Sacramento	2014	HHDT	Aggregated	75	DSL	0	0.158826526	0.18081191	0.621912911	7.053310923	1585.123956	0.11375527	0.03600	0.06174	0.108834267	0.00900	0.02646	0.21149527	0.144294267	0.015122824	0.007377081
Sacramento	2014	MHDT	Aggregated	75	DSL	0	0.24156594	0.275004435	0.775182601	5.93001858	1035.186341	0.232808246	0.01200	0.13034	0.222737064	0.00300	0.05586	0.375148246	0.281597064	0.009876162	0.011220112
Sacramento	2014	OBUS	Aggregated	75	DSL	0	0.201926226	0.229877637	0.586474792	7.328010517	1237.133493	0.140294951	0.01200	0.13034	0.134225854	0.00300	0.05586	0.282634951	0.193085854	0.011802832	0.00937895
Sacramento	2014	SBUS	Aggregated	75	DSL	0	0.101020927	0.115004635	0.256395054	8.654173702	1048.464885	0.076269911	0.01200	0.74480	0.072970508	0.00300	0.31920	0.833069911	0.395170508	0.010002845	0.00469216
Sacramento	2014	HHDT	Aggregated	80	DSL	0	0.158826526	0.18081191	0.621912911	7.053310923	1585.123956	0.11375527	0.03600	0.06174	0.108834267	0.00900	0.02646	0.21149527	0.144294267	0.015122824	0.007377081
Sacramento	2014	MHDT	Aggregated	80	DSL	0	0.24156594	0.275004435	0.775182601	5.93001858	1035.186341	0.232808246	0.01200	0.13034	0.222737064	0.00300	0.05586	0.375148246	0.281597064	0.009876162	0.011220112
Sacramento	2014	OBUS	Aggregated	80	DSL	0	0.201926226	0.229877637	0.586474792	7.328010517	1237.133493	0.140294951	0.01200	0.13034	0.134225854	0.00300	0.05586	0.282634951	0.193085854	0.011802832	0.00937895
Sacramento	2014	SBUS	Aggregated	80	DSL	0	0.101020927	0.115004635	0.256395054	8.654173702	1048.464885	0.076269911	0.01200	0.74480	0.072970508	0.00300	0.31920	0.833069911	0.395170508	0.010002845	0.00469216
Sacramento	2014	HHDT	Aggregated	85	DSL	0	0.158826526	0.18081191	0.621912911	7.053310923	1585.123956	0.11375527	0.03600	0.06174	0.108834267	0.00900	0.02646	0.21149527	0.144294267	0.015122824	0.007377081
Sacramento	2014	MHDT	Aggregated	85	DSL	0	0.24156594	0.275004435	0.775182601	5.93001858	1035.186341	0.232808246	0.01200	0.13034	0.222737064	0.00300	0.05586	0.375148246	0.281597064	0.009876162	0.011220112
Sacramento	2014	OBUS	Aggregated	85	DSL	0	0.201926226	0.229877637	0.586474792	7.328010517	1237.133493	0.140294951	0.01200	0.13034	0.134225854	0.00300	0.05586	0.282634951	0.193085854	0.011802832	0.00937895
Sacramento	2014	SBUS	Aggregated	85	DSL	0	0.101020927	0.115004635	0.256395054	8.654173702	1048.464885	0.076269911	0.01200	0.74480	0.072970508	0.00300	0.31920	0.833069911	0.395170508	0.010002845	0.00469216
Sacramento	2014	HHDT	Aggregated	90	DSL	0	0.158826526	0.18081191	0.621912911	7.053310923	1585.123956	0.11375527	0.03600	0.06174	0.108834267	0.00900	0.02646	0.21149527	0.144294267	0.015122824	0.007377081
Sacramento	2014	MHDT	Aggregated	90	DSL	0	0.24156594	0.275004435	0.775182601	5.93001858	1035.186341	0.232808246	0.01200	0.13034	0.222737064	0.00300	0.05586	0.375148246	0.281597064	0.009876162	0.011220112
Sacramento	2014	OBUS	Aggregated	90	DSL	0	0.201926226	0.229877637	0.586474792	7.328010517	1237.133493	0.140294951	0.01200	0.13034	0.134225854	0.00300	0.05586	0.282634951	0.193085854	0.011802832	0.00937895
Sacramento	2014	SBUS	Aggregated	90	DSL	0	0.101020927	0.115004635	0.256395054	8.654173702	1048.464885	0.076269911	0.01200	0.74480	0.072970508	0.00300	0.31920	0.833069911	0.395170508	0.010002845	0.00469216
Sacramento	2020	LDA	Aggregated	5	DSL	8.541268852	0.242563833	0.276142797	3.48435732	0.206213473	674.1984068	0.053145061	0.0080	0.0368	0.050846029	0.002	0.01575	0.097895061	0.068596029	0.006434496	0.011266623
Sacramento	2020	LDA	Aggregated	5	GAS	837.9824555	0.08852198	0.129058674	1.362648498	0.11691004	923.270661	0.011851604	0.0080	0.0367	0.010897493	0.002	0.01575	0.056601604	0.028647493	0.008966327	0.034296788
Sacramento	2020	LDT1	Aggregated	5	DSL	0.179896671	0.652939426	0.743328126	3.820138861	0.852622624	950.328658	0.404037921	0.0080	0.0367	0.386559419	0.002	0.01575	0.448787921	0.404309419	0.009069861	0.03032778
Sacramento	2020	LDT1	Aggregated	5	GAS	64.26426827	0.200527209	0.292033688	3.425767701	0.305333147	1097.142979	0.016971587	0.0080	0.0368	0.015607038	0.002	0.01575	0.061721587	0.033357038	0.0107042	0.077546266
Sacramento	2020	LDT2	Aggregated	5	DSL	0.542494689	0.264166133	0.300735579	2.294612133	0.171025026	860.623424	0.021037137	0.0080	0.0368	0.02012708	0.002	0.01575	0.065787137	0.03787708	0.008213722	0.012270008
Sacramento	2020	LDT2	Aggregated	5	GAS	320.4838749	0.117524166	0.171390461	1.795065306	0.193893428	1244.579615	0.011584929	0.0080	0.0368	0.010652288	0.002	0.01575	0.056334929	0.028402288	0.012098232	0.045640745
Sacramento	2020	HHDT	Aggregated	5	DSL	4392.477726	0.771637347	3.037452905	7.241358164	18.40374245	4470.876844	0.042341443	0.0360	0.0617	0.040509771	0.009	0.02646	0.140081443	0.075969771	0.030755015	0.04118454
Sacramento	2020	HHDT	Aggregated	5	GAS	36.00578258	3.414691715	4.910948527	70.74364642	6.203823024	4207.367697	0.005327836	0.0200	0.0617	0.004918393	0.005	0.02646	0.087067836	0.036378393	0.043231233	1.306619294
Sacramento	2020	LHDT1	Aggregated	5	DSL	7188.815827	0.812474987	0.924948756	3.357381447	3.230266257	1271.544003	0.120739342	0.0120	0.0764	0.115516211	0.003	0.03276	0.209179342	0.151276211	0.012135515	0.037737899
Sacramento	2020	LHDT1	Aggregated	5	GAS	11563.00554	0.318398147	0.463064813	3.517720415	0.656355799	1395.395393	0.00949968	0.0080	0.0764	0.008736149	0.002	0.03276	0.09393968	0.043496149	0.013992298	0.125269679
Sacramento	2020	LHDT2	Aggregated	5	DSL	2483.180441	0.765021003	0.87092555	3.099435165	2.169754912	1318.546231	0.078183689	0.0120	0.0892	0.074801497	0.003	0.03822	0.179363689	0.116021497	0.012584101	0.035533753
Sacramento	2020	LHDT2	Aggregated	5	GAS	1924.734469	0.16821158	0.244847601	1.832227435	0.403427146	1468.026298	0.00705124	0.0080	0.0892	0.006483963	0.002	0.03822	0.10423124	0.046703963	0.014684748	0.066427375
Sacramento	2020	MDV	Aggregated	5	DSL	3.163633998	0.213996498	0.243620785	3.627696549	0.162921508	1056.5911	0.022412698	0.0080	0.0368	0.021443135	0.002	0.01575	0.067162698	0.039193135	0.010084022	0.009939725
Sacramento	2020	MDV	Aggregated	5	GAS	191.8080485	0.251738169	0.357414331	3.355951036	0.368464969	1673.951791	0.011910116	0.0080	0.0367	0.010958529	0.002	0.01575	0.056660116	0.028708529	0.016296019	0.089215982
Sacramento	2020	MH	Aggregated	5	DSL	60.56999259	1.165470553	1.326810739	2.510542269	16.1247856	2091.234808	0.39438367	0.0160	0.1303	0.377322807	0.004	0.05586	0.54072367	0.437182807	0.019958579	0.054133864

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2020	MH	Aggregated	5	GAS	249.2647932	0.739190324	1.04420432	11.97163051	1.048642835	3895.971139	0.012184446	0.0120	0.1303	0.011226019	0.003	0.05586	0.154524446	0.070086019	0.039093711	0.263093098	
Sacramento	2020	MHDT	Aggregated	5	DSL	4806.675378	0.910613539	1.036664197	2.011361542	10.84798475	2250.840751	0.09374642	0.0120	0.1303	0.089690991	0.003	0.05586	0.23608642	0.148550991	0.021474067	0.042295628	
Sacramento	2020	MHDT	Aggregated	5	GAS	810.5132673	0.689292831	1.005814481	6.136021417	1.292295341	3874.707893	0.00627645	0.0120	0.1303	0.005770964	0.003	0.05586	0.14861645	0.064630964	0.038789696	0.275325818	
Sacramento	2020	OBUS	Aggregated	5	DSL	293.8002623	0.808199151	0.920073212	2.708383841	14.44326723	2704.262831	0.043005603	0.0120	0.1303	0.041145199	0.003	0.05586	0.185345603	0.100005199	0.026203375	0.038501804	
Sacramento	2020	OBUS	Aggregated	5	GAS	332.0633267	0.415655872	0.606476422	3.287581839	0.871825156	3839.224176	0.005382681	0.0120	0.1303	0.004949208	0.003	0.05586	0.147722681	0.063809208	0.038379941	0.166109441	
Sacramento	2020	SBUS	Aggregated	5	DSL	162.7177979	0.767435629	0.873667046	1.33630936	18.08719902	2313.051743	0.136966549	0.0120	0.7448	0.131041437	0.003	0.3192	0.893766549	0.453241437	0.022067589	0.035645387	
Sacramento	2020	SBUS	Aggregated	5	GAS	66.4670379	0.361492433	0.527488909	2.693844737	0.816687816	1820.982424	0.005866689	0.0080	0.7448	0.005394204	0.002	0.3192	0.758666689	0.326594204	0.018228893	0.145448642	
Sacramento	2020	UBUS	Aggregated	5	DSL	710.699439	3.569630191	22.8208523	39.75260845	24.43940736	3326.743834	0.266305503	0.0120	0.8418	0.254785245	0.003	0.36078	1.120125503	0.618565245	0.039070358	0.187889261	
Sacramento	2020	UBUS	Aggregated	5	GAS	541.7520433	0.990027592	1.443907147	6.763461345	1.970451715	3894.227541	0.005932697	0.0120	0.1303	0.005455265	0.003	0.05586	0.148272697	0.064315265	0.039007086	0.394905195	
Sacramento	2020	MCY	Aggregated	5	GAS	9.459019823	13.1173919	15.97359399	57.79087253	1.520619439	547.6259507	0.009896473	0.0040	0.0118	0.009277963	0.001	0.00504	0.025656473	0.015317963	0.006833254	2.389746599	
Sacramento	2020	LDA	Aggregated	10	DSL	651.072437	0.178383325	0.203077556	2.598289742	0.187032063	561.6709113	0.038805312	0.0080	0.0368	0.037126612	0.002	0.01575	0.083555312	0.054876612	0.005360543	0.008285562	
Sacramento	2020	LDA	Aggregated	10	GAS	63876.60767	0.056895269	0.082942919	1.242202517	0.10053187	689.4893384	0.007489819	0.0080	0.0367	0.006886876	0.002	0.01575	0.052239819	0.024636876	0.006653333	0.021816193	
Sacramento	2020	LDT1	Aggregated	10	DSL	13.71292319	0.458462144	0.521928671	2.744039495	0.887106352	799.9548532	0.281927046	0.0080	0.0367	0.269731007	0.002	0.01575	0.326677046	0.287481007	0.007634706	0.021294684	
Sacramento	2020	LDT1	Aggregated	10	GAS	4898.650831	0.132626402	0.193126553	2.989041657	0.256017691	819.013974	0.010931968	0.0080	0.0368	0.010053136	0.002	0.01575	0.055681968	0.027803136	0.00794498	0.050808611	
Sacramento	2020	LDT2	Aggregated	10	DSL	41.3525608	0.19682369	0.224070686	1.714472869	0.147964107	724.44399	0.016576374	0.0080	0.0368	0.015859288	0.002	0.01575	0.061326374	0.033609288	0.006914036	0.009142082	
Sacramento	2020	LDT2	Aggregated	10	GAS	24429.41688	0.075705077	0.110398481	1.632104643	0.165582831	929.2303733	0.00732453	0.0080	0.0368	0.006734895	0.002	0.01575	0.05207453	0.024484895	0.008977194	0.02910636	
Sacramento	2020	HHDT	Aggregated	10	DSL	14442.46118	0.644978771	1.988933627	5.091890652	15.13674211	3660.754938	0.040079817	0.0360	0.0617	0.038345982	0.009	0.02646	0.137819817	0.073805982	0.027373876	0.03299973	
Sacramento	2020	HHDT	Aggregated	10	GAS	175.9788427	2.184662497	3.138482748	61.65664337	5.387872304	3568.945352	0.003429881	0.0200	0.0617	0.003167324	0.005	0.02646	0.085169881	0.034627324	0.036665221	0.830195655	
Sacramento	2020	LHDT1	Aggregated	10	DSL	23906.08912	0.581449612	0.661941725	2.431348779	3.34121219	1068.931133	0.086323403	0.0120	0.0764	0.082589091	0.003	0.03276	0.174763403	0.118349091	0.010201794	0.027007215	
Sacramento	2020	LHDT1	Aggregated	10	GAS	30151.47212	0.208206098	0.302744727	2.792877122	0.578613307	1372.487603	0.006042472	0.0080	0.0764	0.005556905	0.002	0.03276	0.090482472	0.040316905	0.01374788	0.08182757	
Sacramento	2020	LHDT2	Aggregated	10	DSL	8257.706743	0.556739718	0.633811155	2.27059752	2.198803526	1171.833231	0.057800053	0.0120	0.0892	0.055299648	0.003	0.03822	0.158980053	0.096519648	0.011183883	0.025859488	
Sacramento	2020	LHDT2	Aggregated	10	GAS	5018.900795	0.109864664	0.159893593	1.452402646	0.354898701	1523.74854	0.004471115	0.0080	0.0892	0.004111448	0.002	0.03822	0.101651115	0.044331448	0.015232472	0.043348289	
Sacramento	2020	MDV	Aggregated	10	DSL	241.1532681	0.159289733	0.181340771	2.712887615	0.13961001	897.3030368	0.017583758	0.0080	0.0368	0.016823093	0.002	0.01575	0.062333758	0.034573093	0.008563789	0.007398702	
Sacramento	2020	MDV	Aggregated	10	GAS	14620.8878	0.163869859	0.232266868	2.942846597	0.314114971	1249.700194	0.007573294	0.0080	0.0367	0.006968667	0.002	0.01575	0.052323294	0.024718667	0.012092396	0.057187998	
Sacramento	2020	MH	Aggregated	10	DSL	301.4946056	0.880816086	1.002750554	2.039353272	13.43095196	1898.850194	0.334715523	0.0160	0.1303	0.320235877	0.004	0.05586	0.481055523	0.380095877	0.018122476	0.040912212	
Sacramento	2020	MH	Aggregated	10	GAS	1253.056312	0.491610072	0.693353597	9.003519948	0.944547753	3325.847875	0.007869984	0.0120	0.1303	0.007252081	0.003	0.05586	0.150209984	0.066112081	0.033348322	0.174051928	
Sacramento	2020	MHDT	Aggregated	10	DSL	23925.81929	0.70443657	0.801947413	1.621822501	8.767739484	2004.142723	0.084320284	0.0120	0.1303	0.080672626	0.003	0.05586	0.226660284	0.139532626	0.019120453	0.032719245	
Sacramento	2020	MHDT	Aggregated	10	GAS	4074.457336	0.439786027	0.641734738	5.263097752	1.131337263	3307.696221	0.003982884	0.0120	0.1303	0.003662115	0.003	0.05586	0.146322884	0.062522115	0.033107532	0.175746308	
Sacramento	2020	OBUS	Aggregated	10	DSL	1458.194577	0.647595018	0.737237632	2.190003207	11.82747066	2404.543862	0.038086342	0.0120	0.1303	0.036438744	0.003	0.05586	0.180426342	0.095298744	0.023313342	0.030888542	
Sacramento	2020	OBUS	Aggregated	10	GAS	1669.285269	0.262675222	0.383261839	2.927126476	0.759681104	3277.405071	0.003393592	0.0120	0.1303	0.003120305	0.003	0.05586	0.145733592	0.061980305	0.032761567	0.105022114	
Sacramento	2020	SBUS	Aggregated	10	DSL	570.3175415	0.591256606	0.673100639	1.107351863	14.72811289	2075.969097	0.113314474	0.0120	0.7448	0.10841254	0.003	0.3192	0.870114474	0.43061254	0.01980571	0.02746233	
Sacramento	2020	SBUS	Aggregated	10	GAS	232.9635611	0.22798241	0.332671398	2.458881838	0.706600764	1554.506003	0.003691306	0.0080	0.7448	0.00339402	0.002	0.3192	0.756491306	0.32459402	0.015560291	0.091515936	
Sacramento	2020	UBUS	Aggregated	10	DSL	2354.11678	2.718699817	17.21936882	32.04800444	20.28584096	3020.6977	0.225502116	0.0120	0.8418	0.215746994	0.003	0.36078	1.079322116	0.579526994	0.035476053	0.147553679	
Sacramento	2020	UBUS	Aggregated	10	GAS	1794.496388	0.638754183	0.931554335	5.900546115	1.722495004	3324.359429	0.003755051	0.0120	0.1303	0.003452888	0.003	0.05586	0.146095051	0.062312888	0.033292197	0.2546879	
Sacramento	2020	MCY	Aggregated	10	GAS	721.0295326	8.588381628	10.4473502	43.12582118	1.38347418	406.1908725	0.006509204	0.0040	0.0118	0.006104267	0.001	0.00504	0.022269204	0.012144267	0.005036031	1.559773251	
Sacramento	2020	LDA	Aggregated	15	DSL	2064.49098	0.097296888	0.110766038	1.317170558	0.153764432	461.9727262	0.029270769	0.0080	0.0368	0.028004528	0.002	0.01575	0.074020769	0.045754528	0.004409031	0.004519253	
Sacramento	2020	LDA	Aggregated	15	GAS	202546.8641	0.038125233	0.055575366	1.120961789	0.088324129	530.3720876	0.004992665	0.0080	0.0367	0.004590763	0.002	0.01575	0.049742665	0.022340763	0.00512419	0.014633113	
Sacramento	2020	LDT1	Aggregated	15	DSL	43.48242166	0.32052532	0.364896767	1.896365224	0.918303667	663.2944129	0.205743046	0.0080	0.0367	0.196842693	0.002	0.01575	0.250493046	0.214592693	0.006330429	0.014887784	
Sacramento	2020	LDT1	Aggregated	15	GAS	15533.17247	0.09131003	0.13294809	2.615340458	0.220979398	630.0346813	0.007418486	0.0080	0.0368	0.006822187	0.002	0.01575	0.052168486	0.024572187	0.006120584	0.035015922	
Sacramento	2020	LDT2	Aggregated	15	DSL	131.1251774	0.099067739	0.112782034	0.852820367	0.109766328	600.6834624	0.013145445	0.0080	0.0368	0.012576779	0.002	0.01575	0.057895445	0.030326779	0.005732875	0.004601506	
Sacramento	2020	LDT2	Aggregated	15	GAS	77463.4402	0.050844073	0.074140638	1.470421791	0.144701895	714.8056902	0.004884444	0.0080	0.0368	0.004491255	0.002	0.01575	0.049634444	0.022241255	0.00691385	0.019568426	
Sacramento	2020	HHDT	Aggregated	15	DSL	14626.73297	0.460152283	0.895957979	2.770651353	10.5864192	2651.397074	0.034639308	0.0360	0.0617	0.033140827	0.009	0.02646	0.132379308	0.068600827	0.022929058	0.022131163	
Sacramento	2020	HHDT	Aggregated	15	GAS	191.9076984	1.472700567	2.113106169	54.68357081	4.781170238	2574.532893	0.002328898	0.0200	0.0617	0.002151298	0.005	0.02646	0.084068898	0.033611298	0.026602573	0.556496465	
Sacramento	2020	LHDT1	Aggregated	15	DSL	51773.74046	0.369228488	0.420342086	1.58145231	3.434819651	698.1014797	0.06414308	0.0120	0.0764	0.061368279	0.003	0.03276	0.15258308	0.097128279	0.006662625	0.017149953	
Sacramento	2020	LHDT1	Aggregated	15	GAS	68658.96763	0.143795721	0.209050447	2.314762343	0.518743793	953.4494904	0.004054782	0.0080	0.0764	0.003729006	0.002	0.03276	0.088494782	0.038489006	0.009556147	0.056339193	
Sacramento	2020	LHDT2	Aggregated	15	DSL	17883.82715	0.32269065	0.367361852	1.347370631	2.19408058	780.0541443	0.043974522	0.0120	0.0892	0.042072204	0.003	0.03822	0.145154522	0.083292204	0.007444775	0.01498836	
Sacramento	2020	LHDT2	Aggregated	15	GAS	11428.71386	0.075780346	0.110273199	1.202094407	0.317478749	1071.894553	0.002991027	0.0080	0.0892	0.002750447	0.002	0.03822	0.100171027	0.042970447	0.010718103	0.029818026	
Sacramento	2020	MDV	Aggregated	15	DSL	764.6748941	0.080668269	0.091835462	1.338035638	0.101230152	760.9732321	0.013906887	0.0080	0.0368	0.013305281	0.002	0.01575	0.058656887	0.031055281	0.007262668	0.003746886	
Sacramento	2020	MDV	Aggregated	15	GAS	46361.49417	0.111382647	0.157548285	2.591206707	0.274589655	961.3352979	0.005078496	0.0080	0.0367	0.004673352	0.002	0.01575	0.049828496	0.022423352	0.009313424	0.038637852	
Sacramento	2020	MH	Aggregated	15	DSL	406.9130726	0.448666096	0.510776521	1.296324072	9.31505441	1559.12061	0.236973471	0.0160	0.1303	0.226722103	0.004	0.05586	0.383313471	0.286582103	0.014880123	0.020839677	
Sacramento	2020	MH	Aggregated	15	GAS	1582.824973	0.34551074	0.486913675	7.133483714	0.858580591	2292.51301	0.005360869	0.0120	0.1303	0.00494072	0.003	0.05586	0.147700869	0.06380072	0.023001336	0.121260262	
Sacramento	2020	MHDT	Aggregated	15	DSL	32291.55169	0.407625604	0.464050722	1.087400434	6.009029167	1677.879638	0.068905185	0.0120	0.1303	0.065924377	0.003	0.05586	0.211245185	0.124784377	0.016007752	0.018933148	
Sacramento	2020	MHDT	Aggregated	15	GAS	5146.73823	0.297525137	0.434147981	4.637091624	0.998699137	2280.001042	0.002666456	0.0120	0.1303	0.002451708	0.003	0.05586	0.145006456	0.061311708	0.022836156	0.118346335	
Sacramento	2020	OBUS	Aggregated	15	DSL	1874.49566	0.431686052	0.49144171	1.496304849	8.346117027	1998.582236	0.031026079	0.0120	0.1303	0.029683904	0.003	0.05586	0.173366079	0.088543904	0.019591873	0.020996715	
Sacramento	2020	OBUS	Aggregated	15	GAS	2108.593514	0.175962496	0.256740175	2.645348144	0.667271164	2259.121297	0.002257176	0.0120	0.1303	0.002075406	0.003	0.05586	0.144597176	0.060935406	0.022591944	0.070051931	
Sacramento	2020	SBUS	Aggregated	15	DSL	1140.635083	0.333155875	0.379272603	0.781259431	10.08011766	1725.270897	0.075529818	0.0120	0.7448	0.072262432	0.003	0.3192	0.832329818	0.394462432	0.016459886	0.015474223	
Sacramento	2020	SBUS	Aggregated	15	GAS	465.9271222	0.151329285	0.220819337	2.245370997	0.623890326	1071.523825	0.002450201	0.0080	0.7448	0.002252869	0.002	0.3192	0.755250201	0.323452869	0.010734065	0.060746095	
Sacramento	2020	UBUS	Aggregated	15	DSL	4010.997468	1.416640894	8.722798025	19.9067099	14.20666512	2480.25466	0.158766973	0.0120	0.8418	0.151898784	0.003	0.36078	1.012586973	0.515678784	0.029128915	0.083193123	
Sacramento	2020	UBUS	Aggregated	15	GAS	3057.503573	0.43488747	0.634212713	5.238964797	1.529650208	2291.487022	0.002507459	0.0120	0.1303	0.002305703	0.003	0.05586	0.144847459	0.061165703	0.022966309	0.173237062	
Sacramento	2020	MCY	Aggregated	15	GAS	2286.318514	5.943324623	7.22161462	33.88676525	1.28898504	312.7025255	0.00451064	0.0040	0.0118	0.00423124	0.001	0.00504	0.02027064	0.01027124	0.003865054	1.073120044	
Sacramento	2020	LDA	Aggregated	20	DSL	7741.33673	0.049377257	0.056212724	0.567786177	0.132011357	378.9676364	0.0228674	0.0080	0.0368	0.021878166	0.002	0.01575	0.0676174	0.039628166	0.003616837	0.002293479	
Sacramento	2020	LDA	Aggregated	20	GAS	759501.2491	0.026852489	0.039139952	1.013308143	0.079190387	422.6162908	0.00350987	0.0080	0.0367	0.003227342	0.002	0.01575	0.04825987	0.020977342	0.004095963	0.010345622	
Sacramento	2020	LDT1	Aggregated	20	DSL	163.0484565	0.234123165	0.266533658	1.376684485	0.954346505	544.9469995	0.157041774	0.0080	0.0367	0.150248216	0.002	0.01575	0.201791774	0.167998216	0.005200931	0.01087457	
Sacramento	2020	LDT1	Aggregated	20	GAS	58245.60133	0.065886136	0.0959196	2.312985765	0.195835125	502.1097925	0.005299303	0.0080	0.0368	0.0048734	0.002	0.01575	0.050049303	0.0226234	0.004893604	0.025352378	
Sacramento	2020	LDT2	Aggregated	20	DSL	491.6873755	0.041871536	0.04766796	0.349570397	0.08380622	493.5073236	0.010612508	0.0080	0.0368	0.010153416	0.002	0.01575	0.055362508	0.027903416	0.004709995	0.001944852	
Sacramento	2020	LDT2	Aggregated	20	GAS	290468.973	0.035880337	0.052317825	1.327698276	0.129205197	569.6301598	0.003434934	0.0080	0.0368	0.003158439	0.002	0.01575	0.048184934	0.020908439	0.005526425	0.013862221	
Sacramento	2020	HHDT	Aggregated	20	DSL	57662.54431	0.295326901	0.394966658	1.459628365	6.728742737	2078.641953	0.024790035	0.0360	0.0617	0.023717629	0.009	0.02646	0.122530035	0.059177629	0.019893361	0.015157914	
Sacramento	2020	HHDT	Aggregated	20	GAS	327.9669756	1.043196488	1.49456747	48.96571624	4.349821582	2080.056019	0.001667313	0.0200	0.0617	0.001540627	0.005	0.02646	0.083407313	0.033000627	0.021563459	0.393485716	
Sacramento	2020	LHDT1	Aggregated	20	DSL	56760.74239	0.240200881	0.273452734	1.067849764	3.547361814	595.0260934	0.049592661	0.0120	0.0764	0.047447305	0.003	0.03276	0.138032661	0.083207305	0.005678882	0.011156869	
Sacramento	2020	LHDT1	Aggregated	20	GAS	79334.90395	0.104106968	0.151317222	1.975210898	0.475770418	827.8041693	0.002870082	0.0080	0.0764	0.002639532	0.002	0.03276	0.087310082	0.037399532	0.008295527	0.040865959	
Sacramento	2020	LHDT2	Aggregated	20	DSL	19606.45101	0.183055665	0.208396704	0.798072258	2.219352525	665.3287988	0.034555339	0.0120	0.0892	0.03306049	0.003	0.03822	0.135735339	0.07428049	0.006349845	0.008502583	
Sacramento	2020	LHDT2	Aggregated	20	GAS	13205.79011	0.054813406	0.079749314	1.024805059	0.290507807	938.0896952	0.0021107	0.0080	0.0892	0.001940946	0.002	0.03822	0.0992907	0.042160946	0.009379301	0.021609983	

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2020	MDV	Aggregated	20	DSL	2867.344009	0.034636239	0.039431055	0.535578984	0.075012914	631.9852561	0.011208215	0.0080	0.0368	0.010723353	0.002	0.01575	0.055958215	0.028473353	0.006031617	0.001608787	
Sacramento	2020	MDV	Aggregated	20	GAS	173844.275	0.079577081	0.112315861	2.306091742	0.245671217	766.1170023	0.003590216	0.0080	0.0367	0.003304016	0.002	0.01575	0.048340216	0.021054016	0.007444813	0.027497672	
Sacramento	2020	MH	Aggregated	20	DSL	431.5461014	0.199394697	0.226997605	0.819093265	6.926864152	1279.443886	0.168023742	0.0160	0.1303	0.160755109	0.004	0.05586	0.314363742	0.220615109	0.012210911	0.0092615	
Sacramento	2020	MH	Aggregated	20	GAS	1641.778218	0.254597337	0.358353037	5.889125401	0.799896536	1611.828641	0.003849672	0.0120	0.1303	0.003548473	0.003	0.05586	0.146189672	0.062408473	0.016185824	0.08891567	
Sacramento	2020	MHDT	Aggregated	20	DSL	34246.3641	0.23481407	0.267317945	0.75351907	4.250847372	1454.082606	0.057308705	0.0120	0.1303	0.054829555	0.003	0.05586	0.199648705	0.113689555	0.013872624	0.010906502	
Sacramento	2020	MHDT	Aggregated	20	GAS	5338.431514	0.21137119	0.308432344	4.136679474	0.902829053	1603.03168	0.001883072	0.0120	0.1303	0.001731415	0.003	0.05586	0.144223072	0.060591415	0.016069365	0.084053618	
Sacramento	2020	OBUS	Aggregated	20	DSL	1997.59926	0.302090922	0.343907519	1.079136042	6.223813466	1745.701644	0.02631976	0.0120	0.1303	0.025181179	0.003	0.05586	0.16865976	0.084041179	0.017094404	0.014684121	
Sacramento	2020	OBUS	Aggregated	20	GAS	2187.129316	0.123843178	0.180693463	2.400201209	0.600027592	1588.35147	0.00158381	0.0120	0.1303	0.001456267	0.003	0.05586	0.14392381	0.060316267	0.015892386	0.049292405	
Sacramento	2020	SBUS	Aggregated	20	DSL	1548.22661	0.181153435	0.206229396	0.557995023	7.572680484	1464.101996	0.049715987	0.0120	0.7448	0.047565296	0.003	0.3192	0.806515987	0.369765296	0.013968213	0.008414105	
Sacramento	2020	SBUS	Aggregated	20	GAS	632.4202891	0.105995364	0.154668186	2.056440306	0.559487066	753.370988	0.00171577	0.0080	0.7448	0.001577587	0.002	0.3192	0.75451577	0.322777587	0.007554364	0.042537862	
Sacramento	2020	UBUS	Aggregated	20	DSL	35138.31544	0.647651071	3.834755463	12.12263333	11.1016967	2035.343923	0.111860672	0.0120	0.8418	0.107021629	0.003	0.36078	0.965680672	0.470801629	0.023903739	0.040580042	
Sacramento	2020	UBUS	Aggregated	20	GAS	26785.2388	0.311736259	0.454599117	4.706343527	1.383535837	1611.107286	0.001766306	0.0120	0.1303	0.001624196	0.003	0.05586	0.144106306	0.060484196	0.016163436	0.12423167	
Sacramento	2020	MCY	Aggregated	20	GAS	8573.135778	4.339343792	5.26682716	27.91075547	1.224087839	249.8548094	0.003291338	0.0040	0.0118	0.003088273	0.001	0.00504	0.019051338	0.009128273	0.003086231	0.777854169	
Sacramento	2020	LDA	Aggregated	25	DSL	25002.58258	0.034293575	0.039040955	0.366033973	0.124114527	317.6664591	0.018550963	0.0080	0.0368	0.017748457	0.002	0.01575	0.063300963	0.035498457	0.003031783	0.001592871	
Sacramento	2020	LDA	Aggregated	25	GAS	2452999.186	0.019955491	0.029084679	0.922649439	0.072290956	349.837749	0.002601821	0.0080	0.0367	0.002392394	0.002	0.01575	0.047351821	0.020142394	0.003397938	0.0077068	
Sacramento	2020	LDT1	Aggregated	25	DSL	526.6057584	0.184664365	0.210228102	1.115848968	0.995717589	456.9184148	0.12538768	0.0080	0.0367	0.119963465	0.002	0.01575	0.17013768	0.137713465	0.004360793	0.008577304	
Sacramento	2020	LDT1	Aggregated	25	GAS	188118.733	0.049963626	0.072730426	2.074261173	0.177601145	415.6854865	0.003981822	0.0080	0.0368	0.003661845	0.002	0.01575	0.048731822	0.021411845	0.004060464	0.019263534	
Sacramento	2020	LDT2	Aggregated	25	DSL	1588.027319	0.026486108	0.030152673	0.21798666	0.072604126	413.7881009	0.008796006	0.0080	0.0368	0.008415494	0.002	0.01575	0.053546006	0.026165494	0.003949161	0.001230229	
Sacramento	2020	LDT2	Aggregated	25	GAS	938142.176	0.026702899	0.03893398	1.207837246	0.117583042	471.5629295	0.00254688	0.0080	0.0368	0.002341877	0.002	0.01575	0.04729688	0.020091877	0.004584563	0.010342015	
Sacramento	2020	HHDT	Aggregated	25	DSL	31349.72116	0.235488443	0.383448068	1.346681407	5.738252322	2005.80031	0.024839079	0.0360	0.0617	0.023764552	0.009	0.02646	0.122579079	0.059224552	0.018252322	0.011099924	
Sacramento	2020	HHDT	Aggregated	25	GAS	428.0178253	0.782589908	1.120062352	44.50171444	3.976547484	1956.856286	0.001258147	0.0200	0.0617	0.001162878	0.005	0.02646	0.082998147	0.032622878	0.0202523	0.29343363	
Sacramento	2020	LHDT1	Aggregated	25	DSL	60749.13716	0.1831314	0.208482923	0.84607819	3.702058008	527.7314757	0.039949306	0.0120	0.0764	0.038221117	0.003	0.03276	0.128389306	0.073981117	0.005036627	0.008506101	
Sacramento	2020	LHDT1	Aggregated	25	GAS	61112.33466	0.07896897	0.114745623	1.726166957	0.447548857	758.8204885	0.002142484	0.0080	0.0764	0.001970411	0.002	0.03276	0.086582484	0.036730411	0.007602439	0.031213863	
Sacramento	2020	LHDT2	Aggregated	25	DSL	20984.13325	0.133092252	0.15151668	0.60320691	2.293090695	592.9120588	0.028142075	0.0120	0.0892	0.026924661	0.003	0.03822	0.129322075	0.068144661	0.005658706	0.006181879	
Sacramento	2020	LHDT2	Aggregated	25	GAS	10172.52968	0.041552951	0.060442856	0.895081391	0.272628716	848.2725967	0.001571007	0.0080	0.0892	0.00144467	0.002	0.03822	0.098751007	0.04166467	0.00848056	0.016492864	
Sacramento	2020	MDV	Aggregated	25	DSL	9260.804415	0.02211004	0.025170811	0.32844767	0.063467815	534.4085642	0.009279725	0.0080	0.0368	0.008878289	0.002	0.01575	0.054029725	0.026628289	0.005100353	0.001026969	
Sacramento	2020	MDV	Aggregated	25	GAS	561473.5534	0.059919471	0.084394352	2.079710211	0.224310416	634.2375213	0.002674844	0.0080	0.0367	0.002461769	0.002	0.01575	0.047424844	0.020211769	0.006176282	0.020601507	
Sacramento	2020	MH	Aggregated	25	DSL	449.4381501	0.139677079	0.159013068	0.644022619	6.123530389	1147.609165	0.139484194	0.0160	0.1303	0.13345017	0.004	0.05586	0.285824194	0.19331017	0.010952691	0.006487731	
Sacramento	2020	MH	Aggregated	25	GAS	1829.320527	0.197318984	0.277450248	5.058050039	0.756364387	1407.468634	0.002913237	0.0120	0.1303	0.002685667	0.003	0.05586	0.145253237	0.061545667	0.014131285	0.068585422	
Sacramento	2020	MHDT	Aggregated	25	DSL	35666.23004	0.175816211	0.200153373	0.58275437	3.293738264	1334.336224	0.051771481	0.0120	0.1303	0.049531869	0.003	0.05586	0.194111481	0.108391869	0.012730188	0.008166205	
Sacramento	2020	MHDT	Aggregated	25	GAS	5948.246996	0.158422585	0.231169864	3.740218819	0.828785163	1399.787019	0.001402599	0.0120	0.1303	0.001289638	0.003	0.05586	0.143742599	0.060149638	0.014032814	0.062949331	
Sacramento	2020	OBUS	Aggregated	25	DSL	2054.470745	0.220558296	0.251088831	0.790435017	5.012992578	1595.680251	0.023505313	0.0120	0.1303	0.022488483	0.003	0.05586	0.165845313	0.081348483	0.015672761	0.010778383	
Sacramento	2020	OBUS	Aggregated	25	GAS	2436.967741	0.091983398	0.134207454	2.192716382	0.547849595	1386.968079	0.001172348	0.0120	0.1303	0.00107794	0.003	0.05586	0.143512348	0.05993794	0.013878226	0.036586781	
Sacramento	2020	SBUS	Aggregated	25	DSL	2443.979748	0.130435557	0.148490953	0.428840795	6.806271567	1329.515126	0.039332774	0.0120	0.7448	0.037631255	0.003	0.3192	0.796132774	0.359831255	0.012684192	0.006058392	
Sacramento	2020	SBUS	Aggregated	25	GAS	998.3179261	0.078271685	0.114213859	1.887302147	0.510439238	657.8528313	0.001267509	0.0080	0.7448	0.001165427	0.002	0.3192	0.754067509	0.322365427	0.006597398	0.03142444	
Sacramento	2020	UBUS	Aggregated	25	DSL	424.4175347	0.457943411	2.652618754	9.282485162	10.37349768	1825.620777	0.092491315	0.0120	0.8418	0.088490181	0.003	0.36078	0.946311315	0.452270181	0.021440682	0.028935082	
Sacramento	2020	UBUS	Aggregated	25	GAS	323.5250431	0.238174817	0.347322078	4.307082463	1.251095151	1406.838737	0.001312407	0.0120	0.1303	0.001206824	0.003	0.05586	0.143652407	0.060066824	0.014115114	0.093891488	
Sacramento	2020	MCY	Aggregated	25	GAS	27689.08559	3.335569919	4.044432231	23.95266664	1.179714011	207.2046962	0.002527613	0.0040	0.0118	0.002372229	0.001	0.00504	0.018287613	0.008412229	0.002561873	0.593755993	
Sacramento	2020	LDA	Aggregated	30	DSL	17461.87722	0.027397211	0.031189903	0.287275054	0.121863388	275.1574435	0.015714104	0.0080	0.0368	0.015034319	0.002	0.01575	0.060464104	0.032784319	0.002626081	0.001272548	
Sacramento	2020	LDA	Aggregated	30	GAS	1713181.848	0.01567022	0.02283727	0.848077934	0.067088479	301.2144969	0.002033427	0.0080	0.0367	0.001869758	0.002	0.01575	0.046783427	0.019619758	0.002925437	0.006047076	
Sacramento	2020	LDT1	Aggregated	30	DSL	367.7830108	0.153645065	0.174914691	0.966697988	1.039549526	395.1051213	0.104752918	0.0080	0.0367	0.100221353	0.002	0.01575	0.149502918	0.117971353	0.003770852	0.007136518	
Sacramento	2020	LDT1	Aggregated	30	GAS	131382.6765	0.039848013	0.05799862	1.888139296	0.164456851	357.9035484	0.003145076	0.0080	0.0368	0.002892371	0.002	0.01575	0.047895076	0.020642371	0.003496336	0.015347953	
Sacramento	2020	LDT2	Aggregated	30	DSL	1109.082951	0.020440465	0.023270111	0.168147349	0.067396928	357.8096056	0.007586466	0.0080	0.0368	0.007258279	0.002	0.01575	0.052336466	0.025008279	0.003414906	0.00094942	
Sacramento	2020	LDT2	Aggregated	30	GAS	655201.2555	0.020985615	0.030596378	1.109385295	0.108883152	406.0170141	0.001990737	0.0080	0.0368	0.001830505	0.002	0.01575	0.046740737	0.019580505	0.003947017	0.008122499	
Sacramento	2020	HHDT	Aggregated	30	DSL	51568.15629	0.178349217	0.262487323	0.954160191	4.780240179	1838.154712	0.02286752	0.0360	0.0617	0.021878281	0.009	0.02646	0.12060752	0.057338281	0.017151451	0.00829301	
Sacramento	2020	HHDT	Aggregated	30	GAS	781.640816	0.618550409	0.884394105	40.78350299	3.70086223	1863.135574	0.001000341	0.0200	0.0617	0.000924834	0.005	0.02646	0.082740341	0.032384834	0.019251555	0.230745293	
Sacramento	2020	LHDT1	Aggregated	30	DSL	51279.96823	0.15082507	0.171704314	0.72682511	3.854155658	479.237232	0.0336352	0.0120	0.0764	0.032180156	0.003	0.03276	0.1220752	0.067940156	0.004573802	0.007005534	
Sacramento	2020	LHDT1	Aggregated	30	GAS	54043.36023	0.063533137	0.092302765	1.555997551	0.421631478	688.6774181	0.00168639	0.0080	0.0764	0.001550971	0.002	0.03276	0.08612639	0.036310971	0.006899183	0.025094261	
Sacramento	2020	LHDT2	Aggregated	30	DSL	17713.267	0.107979013	0.122926927	0.508749064	2.374230541	534.7121021	0.023917939	0.0120	0.0892	0.022883259	0.003	0.03822	0.125097939	0.064103259	0.00510325	0.005015417	
Sacramento	2020	LHDT2	Aggregated	30	GAS	8995.854747	0.033402264	0.048581292	0.806586015	0.256277669	766.707924	0.001233151	0.0080	0.0892	0.001133993	0.002	0.03822	0.098413151	0.041353993	0.007664907	0.013249891	
Sacramento	2020	MDV	Aggregated	30	DSL	6467.773046	0.017124351	0.019494935	0.251075758	0.057880061	461.5625744	0.007996547	0.0080	0.0368	0.00765062	0.002	0.01575	0.052746547	0.02540062	0.004405117	0.000795393	
Sacramento	2020	MDV	Aggregated	30	GAS	392134.7814	0.047583136	0.066892844	1.901907983	0.208599176	546.0780489	0.002099625	0.0080	0.0367	0.001932488	0.002	0.01575	0.046849625	0.019682488	0.005317589	0.01624069	
Sacramento	2020	MH	Aggregated	30	DSL	540.4129638	0.113102817	0.128760037	0.547102226	5.686880691	1077.204735	0.124352529	0.0160	0.1303	0.118973094	0.004	0.05586	0.270692529	0.178833094	0.010280757	0.005253408	
Sacramento	2020	MH	Aggregated	30	GAS	2068.307434	0.160316736	0.225134317	4.493144807	0.728929475	1293.406292	0.002322372	0.0120	0.1303	0.002141223	0.003	0.05586	0.144662372	0.061001223	0.012982963	0.055625317	
Sacramento	2020	MHDT	Aggregated	30	DSL	42885.7521	0.140672785	0.160145257	0.471157085	2.789763607	1257.367365	0.049189678	0.0120	0.1303	0.047061754	0.003	0.05586	0.191529678	0.105921754	0.011995869	0.006533885	
Sacramento	2020	MHDT	Aggregated	30	GAS	6725.340528	0.124795838	0.182101793	3.40954542	0.776174455	1286.3472	0.001101716	0.0120	0.1303	0.001012988	0.003	0.05586	0.143441716	0.059872988	0.012894413	0.049700161	
Sacramento	2020	OBUS	Aggregated	30	DSL	2546.072697	0.166039677	0.189023533	0.598398794	4.390650448	1511.256975	0.021683541	0.0120	0.1303	0.020745521	0.003	0.05586	0.164023541	0.079605521	0.014740875	0.008014131	
Sacramento	2020	OBUS	Aggregated	30	GAS	2755.339165	0.071859499	0.10484503	2.009086821	0.51032	1274.567117	0.000915396	0.0120	0.1303	0.000841681	0.003	0.05586	0.143255396	0.059701681	0.012752971	0.028642744	
Sacramento	2020	SBUS	Aggregated	30	DSL	2932.133141	0.100417181	0.114317317	0.340376114	6.429021881	1249.500371	0.03340372	0.0120	0.7448	0.03195869	0.003	0.3192	0.79020372	0.35415869	0.011920814	0.004664117	
Sacramento	2020	SBUS	Aggregated	30	GAS	1197.71904	0.060977857	0.088978746	1.736821932	0.47316357	604.5399311	0.000987816	0.0080	0.7448	0.00090826	0.002	0.3192	0.753787816	0.32210826	0.006062324	0.024490217	
Sacramento	2020	UBUS	Aggregated	30	DSL	443.6287599	0.369756567	2.09849346	7.718777473	10.00814342	1713.621157	0.080748262	0.0120	0.8418	0.077255128	0.003	0.36078	0.934568262	0.441035128	0.020125322	0.024432174	
Sacramento	2020	UBUS	Aggregated	30	GAS	338.1693779	0.189153245	0.275825358	3.93495631	1.171261303	1292.827442	0.001028479	0.0120	0.1303	0.000945743	0.003	0.05586	0.143368479	0.059805743	0.012969778	0.074759976	
Sacramento	2020	MCY	Aggregated	30	GAS	19338.13883	2.695432444	3.265403163	21.3273995	1.150267581	178.3484998	0.002041965	0.0040	0.0118	0.001916841	0.001	0.00504	0.017801965	0.007956841	0.002209369	0.477074059	
Sacramento	2020	LDA	Aggregated	35	DSL	31038.55068	0.023015163	0.026201233	0.238373692	0.121730549	248.7367864	0.013847857	0.0080	0.0368	0.013248805	0.002	0.01575	0.058597857	0.030998805	0.002373924	0.00106901	
Sacramento	2020	LDA	Aggregated	35	GAS	3045187.005	0.012939207	0.018855924	0.780740992	0.063193165	268.9352615	0.001675319	0.0080	0.0367	0.001540478	0.002	0.01575	0.046425319	0.019290478	0.002613765	0.004996423	
Sacramento	2020	LDT1	Aggregated	35	DSL	653.7356478	0.133836973	0.152364496	0.882895196	1.084552076	356.597557	0.09154991	0.0080	0.0367	0.087589502	0.002	0.01575	0.13629991	0.105339502	0.003403339	0.00621647	
Sacramento	2020	LDT1	Aggregated	35	GAS	233533.1884	0.033251069	0.048391476	1.731407542	0.155237689	319.5600289	0.002610119	0.0080	0.0368	0.002400423	0.002	0.01575	0.047360119	0.020150423	0.003124068	0.012814314	
Sacramento	2020	LDT2	Aggregated	35	DSL	1971.399005	0.016610503	0.018909953	0.136917948	0.06442351	322.9369207	0.006756252	0.0080	0.0368	0.006463979	0.002	0.01575	0.051506252	0.024213979	0.003082084	0.000771526	
Sacramento	2020	LDT2	Aggregated	35	GAS	1164622.63	0.017333159	0.025270061	1.020909462	0.102439003	362.5137406	0.001640136	0.0080	0.0368	0.001508129	0.002	0.01575	0.046390136	0.019258129	0.003526489	0.006713457	
Sacramento	2020	HHDT	Aggregated	35	DSL	94588.32639	0.132630002	0.211662661	0.742990536	4.231074512	1777.538326	0.020832421	0.0360	0.0617	0.01993122	0.009	0.02646	0.118572421	0.05539122	0.016270784	0.006212737	
Sacramento	2020	HHDT	Aggregated	35	GAS	1390.253039	0.515270985	0.736047141	37.67943386	3.500323133	1786.895598	0.000837782	0.0200	0.0617	0.000774727	0.005	0.02646	0.082577782	0.032234727	0.018437475	0.191306449	
Sacramento	2020	LHDT1	Aggregated	35	DSL	27062.42997	0.130224738	0.148252207	0.658860681	4.032916494	479.237232	0.029533599	0.0120	0.0764	0.028255988	0.003	0.03276	0.117973599	0.064015988	0.004573802	0.006048688	

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2020	LHDT1	Aggregated	35	GAS	20194.04058	0.053152381	0.077194365	1.42050247	0.411707734	688.6774181	0.001399396	0.0080	0.0764	0.00128704	0.002	0.03276	0.085839396	0.03604704	0.006896877	0.021225966
Sacramento	2020	LHDT2	Aggregated	35	DSL	9347.97864	0.091995248	0.104730474	0.453521098	2.47513768	534.7121021	0.021118845	0.0120	0.0892	0.020205253	0.003	0.03822	0.122298845	0.061425253	0.00510325	0.004273002
Sacramento	2020	LHDT2	Aggregated	35	GAS	3361.424142	0.027939508	0.040625465	0.73641172	0.249691529	766.707924	0.001020671	0.0080	0.0892	0.000938606	0.002	0.03822	0.098200671	0.041158606	0.007663707	0.011200302
Sacramento	2020	MDV	Aggregated	35	DSL	11496.49026	0.013965014	0.01589824	0.202386878	0.054509817	418.8042089	0.007117804	0.0080	0.0368	0.006809891	0.002	0.01575	0.051867804	0.024559891	0.003997034	0.000648648
Sacramento	2020	MDV	Aggregated	35	GAS	697021.0092	0.039670805	0.055671603	1.749622118	0.197235775	487.5713651	0.001736	0.0080	0.0367	0.001597901	0.002	0.01575	0.046486	0.019347901	0.004751164	0.01346619
Sacramento	2020	MH	Aggregated	35	DSL	637.2180596	0.093124407	0.106015946	0.470848707	5.370380596	1018.777787	0.115503483	0.0160	0.1303	0.110506853	0.004	0.05586	0.261843483	0.170366853	0.009723134	0.004325449
Sacramento	2020	MH	Aggregated	35	GAS	2570.592345	0.136954461	0.192113157	4.135657014	0.711862286	1194.127634	0.001949593	0.0120	0.1303	0.001797722	0.003	0.05586	0.144289593	0.060657722	0.011985827	0.047415367
Sacramento	2020	MHDT	Aggregated	35	DSL	50567.95001	0.11345108	0.129155419	0.388821167	2.467669274	1195.965243	0.048415195	0.0120	0.1303	0.046320775	0.003	0.05586	0.190755195	0.105180775	0.011410064	0.005269507
Sacramento	2020	MHDT	Aggregated	35	GAS	8358.577933	0.103687758	0.151300932	3.141171061	0.738296495	1187.610381	0.000912465	0.0120	0.1303	0.000838978	0.003	0.05586	0.143252465	0.059698978	0.01190416	0.041358129
Sacramento	2020	OBUS	Aggregated	35	DSL	3068.214519	0.124730875	0.141996606	0.452454666	3.975548482	1442.895686	0.020308616	0.0120	0.1303	0.019430074	0.003	0.05586	0.162648616	0.078290074	0.014005814	0.005968615
Sacramento	2020	OBUS	Aggregated	35	GAS	3424.468552	0.059245185	0.086439733	1.851616884	0.482939915	1176.734509	0.000753957	0.0120	0.1303	0.000693243	0.003	0.05586	0.143093957	0.059553243	0.01177378	0.023649204
Sacramento	2020	SBUS	Aggregated	35	DSL	3009.465796	0.077879934	0.088660376	0.272284883	6.176583104	1185.027167	0.029314448	0.0120	0.7448	0.028046318	0.003	0.3192	0.786114448	0.350246318	0.01130571	0.00361732
Sacramento	2020	SBUS	Aggregated	35	GAS	1229.307917	0.050020761	0.072990177	1.599703925	0.447241244	558.1369463	0.000812151	0.0080	0.7448	0.000746743	0.002	0.3192	0.753612151	0.321946743	0.00559673	0.02013508
Sacramento	2020	UBUS	Aggregated	35	DSL	573.3111894	0.302123059	1.686324664	6.498063703	9.748212977	1620.675358	0.071686103	0.0120	0.8418	0.068584994	0.003	0.36078	0.925506103	0.432364994	0.019033737	0.020860046
Sacramento	2020	UBUS	Aggregated	35	GAS	437.0237139	0.158207636	0.230691819	3.623150632	1.115279254	1193.593216	0.000849971	0.0120	0.1303	0.0007816	0.003	0.05586	0.143189971	0.0596416	0.011973553	0.062692941
Sacramento	2020	MCY	Aggregated	35	GAS	34373.61255	2.287585675	2.769267382	19.60855378	1.13370224	159.3284198	0.00173462	0.0040	0.0118	0.001628631	0.001	0.00504	0.01749462	0.007668631	0.001978681	0.403327542
Sacramento	2020	LDA	Aggregated	40	DSL	38029.95062	0.020203057	0.022999837	0.207094148	0.122872309	232.7619727	0.012670099	0.0080	0.0368	0.012121996	0.002	0.01575	0.057420099	0.029871996	0.002221462	0.000938393
Sacramento	2020	LDA	Aggregated	40	GAS	3731112.082	0.011231757	0.016366641	0.720413333	0.060655393	248.9525739	0.001454953	0.0080	0.0367	0.001337853	0.002	0.01575	0.046204953	0.019087853	0.002423479	0.004346498
Sacramento	2020	LDT1	Aggregated	40	DSL	800.9888948	0.121997807	0.138886393	0.849451877	1.130745094	332.8198201	0.083691135	0.0080	0.0367	0.080070694	0.002	0.01575	0.128441135	0.097820694	0.003176406	0.005666563
Sacramento	2020	LDT1	Aggregated	40	GAS	286136.2862	0.029031734	0.042245914	1.600939526	0.149938437	295.8438271	0.0022753	0.0080	0.0368	0.002092525	0.002	0.01575	0.0470253	0.019842525	0.002896621	0.011207587
Sacramento	2020	LDT2	Aggregated	40	DSL	2415.454496	0.01405009	0.015995094	0.116291452	0.06276362	301.4036573	0.006188362	0.0080	0.0368	0.005920656	0.002	0.01575	0.050938362	0.023670656	0.002876573	0.0006526
Sacramento	2020	LDT2	Aggregated	40	GAS	1426952.617	0.015040542	0.021926652	0.942006869	0.098308318	335.5961598	0.001424193	0.0080	0.0368	0.001309569	0.002	0.01575	0.046174193	0.019059569	0.003269753	0.005838266
Sacramento	2020	HHDT	Aggregated	40	DSL	87769.30069	0.100762894	0.150547581	0.540796325	3.808749081	1670.88388	0.019802268	0.0360	0.0617	0.01894563	0.009	0.02646	0.117542268	0.05440563	0.015547222	0.004678167
Sacramento	2020	HHDT	Aggregated	40	GAS	1211.916607	0.451588854	0.644469187	35.02956564	3.371376587	1722.242928	0.000738845	0.0200	0.0617	0.000683379	0.005	0.02646	0.082478845	0.032143379	0.01774885	0.167198358
Sacramento	2020	LHDT1	Aggregated	40	DSL	14856.38947	0.117649633	0.133936285	0.629308334	4.213155809	466.1175196	0.027011598	0.0120	0.0764	0.025843088	0.003	0.03276	0.115451598	0.061603088	0.004448589	0.005464599
Sacramento	2020	LHDT1	Aggregated	40	GAS	5960.820282	0.046727221	0.067837255	1.325504372	0.409627857	686.0891627	0.001224026	0.0080	0.0764	0.001125764	0.002	0.03276	0.085664026	0.035885764	0.006869519	0.01888291
Sacramento	2020	LHDT2	Aggregated	40	DSL	5131.734717	0.081973456	0.09332133	0.426027514	2.578844244	515.1818749	0.019326632	0.0120	0.0892	0.01849057	0.003	0.03822	0.120506632	0.05971057	0.004916855	0.003807509
Sacramento	2020	LHDT2	Aggregated	40	GAS	992.2157541	0.02456063	0.035702281	0.687408705	0.247927913	749.1945102	0.0008907	0.0080	0.0892	0.000819091	0.002	0.03822	0.0980707	0.041039091	0.00748815	0.009958447
Sacramento	2020	MDV	Aggregated	40	DSL	14086.06225	0.011860629	0.013502537	0.169757891	0.052439022	391.7337306	0.00651918	0.0080	0.0368	0.006237163	0.002	0.01575	0.05126918	0.023987163	0.003738676	0.000550903
Sacramento	2020	MDV	Aggregated	40	GAS	854024.237	0.03473836	0.048662177	1.621111869	0.190314742	451.3774321	0.001511646	0.0080	0.0367	0.001391469	0.002	0.01575	0.046261646	0.019141469	0.004405334	0.011741098
Sacramento	2020	MH	Aggregated	40	DSL	791.0070237	0.078783258	0.089689502	0.412555869	5.143384034	972.3283203	0.112861684	0.0160	0.1303	0.107979337	0.004	0.05586	0.259201684	0.167839337	0.009279824	0.003659331
Sacramento	2020	MH	Aggregated	40	GAS	3200.122493	0.122939369	0.172291764	3.94217263	0.703576611	1110.959658	0.001722959	0.0120	0.1303	0.001588899	0.003	0.05586	0.144062959	0.060448899	0.011152328	0.042463245
Sacramento	2020	MHDT	Aggregated	40	DSL	62772.2379	0.092577203	0.105392098	0.329211688	2.247096636	1145.74044	0.049416814	0.0120	0.1303	0.047279064	0.003	0.05586	0.191756814	0.106139064	0.010930896	0.00429997
Sacramento	2020	MHDT	Aggregated	40	GAS	10405.56793	0.090833404	0.13254389	2.924067372	0.712937393	1104.896315	0.000796731	0.0120	0.1303	0.000732565	0.003	0.05586	0.143136731	0.059592565	0.0110749	0.036266648
Sacramento	2020	OBUS	Aggregated	40	DSL	4125.404077	0.095931164	0.109210328	0.352817208	3.719880825	1404.838179	0.019524728	0.0120	0.1303	0.018680097	0.003	0.05586	0.161864728	0.077540097	0.013406879	0.004458058
Sacramento	2020	OBUS	Aggregated	40	GAS	4263.110354	0.051537501	0.07519357	1.716193755	0.464188171	1094.777919	0.000655018	0.0120	0.1303	0.000602272	0.003	0.05586	0.142995018	0.059462272	0.010953541	0.020591749
Sacramento	2020	SBUS	Aggregated	40	DSL	2031.54851	0.061722813	0.070266725	0.220778846	6.008464	1133.179948	0.027045589	0.0120	0.7448	0.025875609	0.003	0.3192	0.783845589	0.348075609	0.010811063	0.002866864
Sacramento	2020	SBUS	Aggregated	40	GAS	829.8478322	0.043319343	0.063211484	1.478450394	0.428973012	519.2641163	0.000704421	0.0080	0.7448	0.000647689	0.002	0.3192	0.753504421	0.321847689	0.005206678	0.017464213
Sacramento	2020	UBUS	Aggregated	40	DSL	763.8165951	0.25484075	1.40281229	5.557571208	9.580794534	1546.78338	0.065297255	0.0120	0.8418	0.062472525	0.003	0.36078	0.919117255	0.426252525	0.018165925	0.01821557
Sacramento	2020	UBUS	Aggregated	40	GAS	582.2421946	0.139589852	0.203538349	3.366795071	1.075851881	1110.46246	0.000740713	0.0120	0.1303	0.000681134	0.003	0.05586	0.143080713	0.059541134	0.011139285	0.055353031
Sacramento	2020	MCY	Aggregated	40	GAS	42116.23156	2.043871808	2.472553187	18.70969908	1.131142405	147.7316518	0.00154888	0.0040	0.0118	0.001454473	0.001	0.00504	0.01730888	0.007494473	0.001839993	0.358647056
Sacramento	2020	LDA	Aggregated	45	DSL	14736.02267	0.018482099	0.021040641	0.187663719	0.124803487	224.8301846	0.012024217	0.0080	0.0368	0.011504055	0.002	0.01575	0.056774217	0.029254055	0.002145761	0.000858458
Sacramento	2020	LDA	Aggregated	45	GAS	1445748.714	0.010290644	0.014994356	0.670489613	0.059212399	239.6030503	0.001331887	0.0080	0.0367	0.001224694	0.002	0.01575	0.046081887	0.018974694	0.002331889	0.003980645
Sacramento	2020	LDT1	Aggregated	45	DSL	310.3709134	0.116351828	0.132458821	0.860815278	1.177630081	320.8947693	0.080021518	0.0080	0.0367	0.076559823	0.002	0.01575	0.124771518	0.094309823	0.003062594	0.005404318
Sacramento	2020	LDT1	Aggregated	45	GAS	110873.4229	0.026617206	0.038727596	1.501291812	0.147825694	284.731757	0.002083144	0.0080	0.0368	0.001915823	0.002	0.01575	0.046833144	0.019665823	0.002786934	0.010267239
Sacramento	2020	LDT2	Aggregated	45	DSL	935.9515758	0.012295062	0.01399711	0.102441209	0.06192011	290.6042586	0.005817499	0.0080	0.0368	0.005565837	0.002	0.01575	0.050567499	0.023315837	0.002773504	0.000571082
Sacramento	2020	LDT2	Aggregated	45	GAS	552922.2562	0.013765345	0.020066754	0.876833845	0.096048936	322.9917055	0.00130336	0.0080	0.0368	0.001198465	0.002	0.01575	0.04605336	0.018948465	0.003146195	0.00534157
Sacramento	2020	HHDT	Aggregated	45	DSL	120074.4319	0.077411338	0.10451666	0.391471444	3.493668358	1568.419253	0.01932816	0.0360	0.0617	0.018492032	0.009	0.02646	0.11706816	0.053952032	0.014943242	0.003555559
Sacramento	2020	HHDT	Aggregated	45	GAS	1282.337178	0.416299693	0.593441151	32.7939014	3.316770803	1684.365318	0.00068596	0.0200	0.0617	0.000634578	0.005	0.02646	0.08242596	0.032094578	0.017335897	0.154019821
Sacramento	2020	LHDT1	Aggregated	45	DSL	16034.93017	0.111136111	0.126521073	0.63314173	4.37630611	454.6609637	0.025718388	0.0120	0.0764	0.024605822	0.003	0.03276	0.114158388	0.060365822	0.004339248	0.005162058
Sacramento	2020	LHDT1	Aggregated	45	GAS	7338.294334	0.04408721	0.064008452	1.288800614	0.397362397	682.9384397	0.001128338	0.0080	0.0764	0.001037769	0.002	0.03276	0.085568338	0.035797769	0.006837223	0.017662035
Sacramento	2020	LHDT2	Aggregated	45	DSL	5538.829472	0.076272114	0.086830731	0.421434916	2.673306139	495.2163218	0.018308966	0.0120	0.0892	0.017516929	0.003	0.03822	0.119488966	0.058736929	0.004726305	0.003542693
Sacramento	2020	LHDT2	Aggregated	45	GAS	1221.504911	0.02315109	0.033654728	0.668761845	0.240163613	731.5378357	0.000819408	0.0080	0.0892	0.000753535	0.002	0.03822	0.097999408	0.040973535	0.007311516	0.009310231
Sacramento	2020	MDV	Aggregated	45	DSL	5458.133109	0.010431732	0.011875833	0.147121427	0.051176284	376.9871476	0.006131318	0.0080	0.0368	0.00586608	0.002	0.01575	0.050881318	0.02361608	0.003597935	0.000484534
Sacramento	2020	MDV	Aggregated	45	GAS	330921.2952	0.032039902	0.044810469	1.522082259	0.186985523	434.4239023	0.001386132	0.0080	0.0367	0.001275995	0.002	0.01575	0.046136132	0.019025995	0.004238875	0.010763396
Sacramento	2020	MH	Aggregated	45	DSL	647.7298662	0.069615512	0.079252632	0.370914197	4.981902287	937.8563357	0.116384567	0.0160	0.1303	0.111349822	0.004	0.05586	0.262724567	0.171209822	0.008950826	0.003233507
Sacramento	2020	MH	Aggregated	45	GAS	2918.293028	0.116044049	0.162588678	3.897593717	0.697993019	1032.249001	0.001602512	0.0120	0.1303	0.001477948	0.003	0.05586	0.143942512	0.060337948	0.010365854	0.039941022
Sacramento	2020	MHDT	Aggregated	45	DSL	51402.13934	0.076889219	0.087532523	0.287515445	2.088547454	1104.083578	0.052176031	0.0120	0.1303	0.049918919	0.003	0.05586	0.194516031	0.108778919	0.01053347	0.003571304
Sacramento	2020	MHDT	Aggregated	45	GAS	9489.166867	0.084097788	0.122715294	2.758869313	0.693955773	1026.615241	0.000733331	0.0120	0.1303	0.000674271	0.003	0.05586	0.143073331	0.059534271	0.010290802	0.033505172
Sacramento	2020	OBUS	Aggregated	45	DSL	3055.101634	0.069417454	0.079026487	0.255438015	3.420766296	1323.515309	0.01852689	0.0120	0.1303	0.017725425	0.003	0.05586	0.16086689	0.076585425	0.012908153	0.00334703
Sacramento	2020	OBUS	Aggregated	45	GAS	3887.665316	0.047412664	0.069175115	1.603723443	0.450052386	1017.213726	0.000600225	0.0120	0.1303	0.000551891	0.003	0.05586	0.142940225	0.059411891	0.010177564	0.018906459
Sacramento	2020	SBUS	Aggregated	45	DSL	974.6880731	0.051118295	0.058194288	0.183086271	5.908455007	1092.232906	0.026592264	0.0120	0.7448	0.025441894	0.003	0.3192	0.783392264	0.347641894	0.01042041	0.002374312
Sacramento	2020	SBUS	Aggregated	45	GAS	398.1410143	0.039607534	0.057795221	1.371095695	0.4175061	482.4746439	0.000644559	0.0080	0.7448	0.000592648	0.002	0.3192	0.753444559	0.321792648	0.004837738	0.015980087
Sacramento	2020	UBUS	Aggregated	45	DSL	639.6287753	0.227811718	1.241519819	4.866922972	9.492328813	1491.945223	0.061577438	0.0120	0.8418	0.058913625	0.003	0.36078	0.915397438	0.422693625	0.017521888	0.016497232
Sacramento	2020	UBUS	Aggregated	45	GAS	487.5762903	0.13009967	0.189697886	3.163092653	1.046751968	1031.787029	0.000680601	0.0120	0.1303	0.00062586	0.003	0.05586	0.143020601	0.05948586	0.010350519	0.051441979
Sacramento	2020	MCY	Aggregated	45	GAS	16319.39387	1.91863836	2.319743192	18.53330258	1.138170498	142.1703818	0.001453282	0.0040	0.0118	0.001364885	0.001	0.00504	0.017213282	0.007404885	0.001776842	0.335333075
Sacramento	2020	LDA	Aggregated	50	DSL	14772.4723	0.017611566	0.020049597	0.17740826	0.127204189	225.4025079	0.011836517	0.0080	0.0368	0.011324474	0.002	0.01575	0.056586517	0.029074474	0.002151224	0.000818023
Sacramento	2020	LDA	Aggregated	50	GAS	1449324.781	0.009958886	0.014510273	0.629777356	0.058534488	239.9105486	0.001285157	0.0080	0.0367	0.001181727	0.002	0.01575	0.046035157	0.018931727	0.002328515	0.00383807
Sacramento	2020	LDT1	Aggregated	50	DSL	311.1386175	0.116101659	0.13217402	0.918909601	1.224432364	321.427848	0.080028529	0.0080	0.0367	0.07656653	0.002	0.01575	0.124778529	0.09431653	0.003067682	0.005392699
Sacramento	2020	LDT1	Aggregated	50	GAS	111147.669	0.025631706	0.037289614	1.429049735	0.148110494	285.0566857	0.002003268	0.0080	0.0368	0.00184238	0.002	0.01575	0.046753268	0.01959238	0.002782505	0.009853311
Sacramento	2020	LDT2	Aggregated	50	DSL	938.266657	0.011100823	0.012637549	0.093449428	0.061593228	291.0870179	0.00561006	0.0080	0.0368	0.005367371	0.002	0.01575	0.05036006	0.023117371	0.002778111	0.000515612
Sacramento	2020	LDT2	Aggregated	50	GAS	554289.9124	0.0132989	0.019386128	0.823758437	0.095130152	323.3798642	0.001257115	0.0080	0.0368	0.001155944	0.002	0.01575	0.046007115	0.018905944	0.00314167	0.005141941

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2020	HHDT	Aggregated	50	DSL	122162.4804	0.060338028	0.073039849	0.287445789	3.246270528	1479.088098	0.019322072	0.0360	0.0617	0.018486208	0.009	0.02646	0.117062072	0.053946208	0.014434861	0.002745851	
Sacramento	2020	HHDT	Aggregated	50	GAS	1341.687839	0.405153848	0.577202269	31.09057217	3.285648054	1663.447825	0.0006703	0.0200	0.0617	0.000620182	0.005	0.02646	0.0824103	0.032080182	0.017100149	0.149522799	
Sacramento	2020	LHDT1	Aggregated	50	DSL	61915.94626	0.109767433	0.124962925	0.671137226	4.542009176	476.6512489	0.025493242	0.0120	0.0764	0.024390416	0.003	0.03276	0.113933242	0.060150416	0.004549122	0.005098486	
Sacramento	2020	LHDT1	Aggregated	50	GAS	54184.94264	0.044229416	0.064232356	1.300763734	0.384024609	720.2091883	0.001096038	0.0080	0.0764	0.00100807	0.002	0.03276	0.085536038	0.03576807	0.007208959	0.017364651	
Sacramento	2020	LHDT2	Aggregated	50	DSL	21387.17564	0.074091669	0.084348439	0.439251219	2.7701615	513.4559725	0.017954835	0.0120	0.0892	0.017178117	0.003	0.03822	0.119134835	0.058398117	0.004900383	0.003441415	
Sacramento	2020	LHDT2	Aggregated	50	GAS	9019.422022	0.02318971	0.033717535	0.675436336	0.231900762	762.6530942	0.000794596	0.0080	0.0892	0.000730721	0.002	0.03822	0.097974596	0.040950721	0.007621926	0.009149971	
Sacramento	2020	MDV	Aggregated	50	DSL	5471.63383	0.009479125	0.010791353	0.13133556	0.050429588	378.87622	0.005918693	0.0080	0.0368	0.005662653	0.002	0.01575	0.050668693	0.023412653	0.003615965	0.000440287	
Sacramento	2020	MDV	Aggregated	50	GAS	331739.8308	0.031112561	0.043463424	1.449469464	0.186244209	434.9322689	0.00133848	0.0080	0.0367	0.001232182	0.002	0.01575	0.04608848	0.018982182	0.004232756	0.010374921	
Sacramento	2020	MH	Aggregated	50	DSL	724.9150558	0.065371936	0.074421603	0.345220086	4.899788806	915.3618329	0.126046089	0.0160	0.1303	0.120593391	0.004	0.05586	0.272386089	0.180453391	0.008736141	0.003036401	
Sacramento	2020	MH	Aggregated	50	GAS	2840.098873	0.114266897	0.15985524	3.986631043	0.711540391	965.6207536	0.001568257	0.0120	0.1303	0.001446456	0.003	0.05586	0.143908257	0.060306456	0.009702557	0.039447962	
Sacramento	2020	MHDT	Aggregated	50	DSL	57527.35307	0.065528249	0.074598924	0.260188666	1.983331713	1069.32641	0.056681703	0.0120	0.1303	0.054229677	0.003	0.05586	0.199021703	0.113089677	0.010201871	0.003043617	
Sacramento	2020	MHDT	Aggregated	50	GAS	9234.909539	0.081283458	0.118608631	2.615298595	0.696133613	960.3506346	0.000711428	0.0120	0.1303	0.000654132	0.003	0.05586	0.143051428	0.059514132	0.009627476	0.032606112	
Sacramento	2020	OBUS	Aggregated	50	DSL	3981.204461	0.055486721	0.063167408	0.209519453	3.330646007	1321.82798	0.018651422	0.0120	0.1303	0.01784457	0.003	0.05586	0.160991422	0.07670457	0.012486765	0.002535729	
Sacramento	2020	OBUS	Aggregated	50	GAS	3783.497331	0.045615744	0.066552858	1.496599402	0.449980927	951.5559561	0.000580116	0.0120	0.1303	0.000533401	0.003	0.05586	0.142920116	0.059393401	0.00952078	0.018303625	
Sacramento	2020	SBUS	Aggregated	50	DSL	488.1533937	0.045436244	0.051725705	0.157189467	5.864987877	1061.090803	0.02796018	0.0120	0.7448	0.026750635	0.003	0.3192	0.78476018	0.348950635	0.010123299	0.002110395	
Sacramento	2020	SBUS	Aggregated	50	GAS	199.4011137	0.038338395	0.055943295	1.279338339	0.410264044	451.3325068	0.000622197	0.0080	0.7448	0.000572087	0.002	0.3192	0.753422197	0.321772087	0.004525424	0.015425682	
Sacramento	2020	UBUS	Aggregated	50	DSL	601.9655568	0.2209833	1.198988571	4.409796586	9.517051957	1456.160888	0.060524031	0.0120	0.8418	0.057905788	0.003	0.36078	0.914344031	0.421685788	0.017101625	0.015704216	
Sacramento	2020	UBUS	Aggregated	50	GAS	458.8663681	0.125896881	0.183561382	2.971921424	1.053246446	965.1886009	0.000659317	0.0120	0.1303	0.00060629	0.003	0.05586	0.142999317	0.05946629	0.009683214	0.050308796	
Sacramento	2020	MCY	Aggregated	50	GAS	16359.75998	1.886003963	2.279441839	19.01365364	1.150146098	142.0039013	0.001432465	0.0040	0.0118	0.001345482	0.001	0.00504	0.017192465	0.007385482	0.001782638	0.329585922	
Sacramento	2020	LDA	Aggregated	55	DSL	26883.43837	0.017498024	0.019920337	0.17552978	0.129973616	235.8659753	0.012097889	0.0080	0.0368	0.011574539	0.002	0.01575	0.056847889	0.029324539	0.002251086	0.00081275	
Sacramento	2020	LDA	Aggregated	55	GAS	2637529.633	0.010111874	0.014732652	0.591264671	0.058816116	248.7448936	0.001307185	0.0080	0.0367	0.001201984	0.002	0.01575	0.046057185	0.018951984	0.002413042	0.003896465	
Sacramento	2020	LDT1	Aggregated	55	DSL	566.2204456	0.121224081	0.138005556	1.033524751	1.271543856	336.079	0.083719472	0.0080	0.0367	0.080097804	0.002	0.01575	0.128469472	0.097847804	0.003207511	0.005630625	
Sacramento	2020	LDT1	Aggregated	55	GAS	202270.2394	0.025777793	0.037498242	1.371285928	0.151512849	295.5512221	0.00202402	0.0080	0.0368	0.001861481	0.002	0.01575	0.04677402	0.019611481	0.002882964	0.009909788	
Sacramento	2020	LDT2	Aggregated	55	DSL	1707.488993	0.010338771	0.011770004	0.088446359	0.061648545	304.3551905	0.00555533	0.0080	0.0368	0.005315009	0.002	0.01575	0.05030533	0.023065009	0.002904742	0.000480216	
Sacramento	2020	LDT2	Aggregated	55	GAS	1008715.291	0.013474587	0.019641696	0.77388145	0.095899008	335.2863782	0.001277996	0.0080	0.0368	0.001175146	0.002	0.01575	0.046027996	0.018925146	0.003255757	0.005208819	
Sacramento	2020	HHDT	Aggregated	55	DSL	147306.0272	0.048013233	0.054659411	0.220183185	3.076692093	1421.592362	0.019692928	0.0360	0.0617	0.01884102	0.009	0.02646	0.117432928	0.05430102	0.014057545	0.00217543	
Sacramento	2020	HHDT	Aggregated	55	GAS	1969.498351	0.416320575	0.592990415	29.93914643	3.285962825	1632.126724	0.000689253	0.0200	0.0617	0.000637793	0.005	0.02646	0.082429253	0.032097793	0.016768811	0.152959215	
Sacramento	2020	LHDT1	Aggregated	55	DSL	37286.34534	0.113399386	0.129097662	0.749889842	4.735689315	498.08364	0.026326212	0.0120	0.0764	0.025187352	0.003	0.03276	0.114766212	0.060947352	0.004753671	0.005267183	
Sacramento	2020	LHDT1	Aggregated	55	GAS	14903.41803	0.044419509	0.064468531	1.30220003	0.407117722	758.8204885	0.001121751	0.0080	0.0764	0.001031727	0.002	0.03276	0.085561751	0.035791727	0.007594833	0.017941104	
Sacramento	2020	LHDT2	Aggregated	55	DSL	12879.55147	0.075199076	0.085609148	0.482910011	2.884644582	531.4516625	0.018246675	0.0120	0.0892	0.017457332	0.003	0.03822	0.119426675	0.058677332	0.005072132	0.003492852	
Sacramento	2020	LHDT2	Aggregated	55	GAS	2480.766985	0.023317223	0.033887388	0.677279396	0.245519488	797.3762409	0.000812137	0.0080	0.0892	0.000746855	0.002	0.03822	0.097992137	0.040966855	0.007968739	0.009450916	
Sacramento	2020	MDV	Aggregated	55	DSL	9957.461952	0.008900244	0.010132336	0.120783736	0.050061328	399.8467681	0.005870341	0.0080	0.0368	0.005616393	0.002	0.01575	0.050620341	0.023366393	0.003816106	0.000413399	
Sacramento	2020	MDV	Aggregated	55	GAS	603711.2215	0.03166114	0.044181003	1.391025263	0.188824587	450.9452668	0.001361142	0.0080	0.0367	0.001253091	0.002	0.01575	0.046111142	0.019003091	0.004386432	0.010517055	
Sacramento	2020	MH	Aggregated	55	DSL	1062.297323	0.065907747	0.075031588	0.335064798	4.881483965	904.8448119	0.141829334	0.0160	0.1303	0.13569386	0.004	0.05586	0.288169334	0.19555386	0.008635767	0.003061288	
Sacramento	2020	MH	Aggregated	55	GAS	3714.590638	0.118398481	0.165481327	4.269034811	0.728991166	939.0055318	0.001614482	0.0120	0.1303	0.001489173	0.003	0.05586	0.143954482	0.060349173	0.009441626	0.040901477	
Sacramento	2020	MHDT	Aggregated	55	DSL	84301.12287	0.057858206	0.065867163	0.24462369	1.916763625	1041.762971	0.062927382	0.0120	0.1303	0.060205172	0.003	0.05586	0.205267382	0.119065172	0.009938903	0.002687363	
Sacramento	2020	MHDT	Aggregated	55	GAS	12078.42053	0.083035556	0.121165289	2.526764892	0.705507975	933.880672	0.00072738	0.0120	0.1303	0.000668799	0.003	0.05586	0.14306738	0.059528799	0.009362155	0.033419843	
Sacramento	2020	OBUS	Aggregated	55	DSL	6548.074002	0.044048388	0.050145736	0.170398966	3.245136203	1310.570556	0.018914155	0.0120	0.1303	0.018095937	0.003	0.05586	0.161254155	0.076955937	0.012127328	0.001950609	
Sacramento	2020	OBUS	Aggregated	55	GAS	4948.469893	0.046420333	0.067726356	1.411525854	0.455005976	925.3283996	0.00059135	0.0120	0.1303	0.000543731	0.003	0.05586	0.14293135	0.059403731	0.009257833	0.018683007	
Sacramento	2020	SBUS	Aggregated	55	DSL	726.5851316	0.044187845	0.050304498	0.141631358	5.89798237	1039.023775	0.031163697	0.0120	0.7448	0.02981557	0.003	0.3192	0.787963697	0.35201557	0.00991277	0.00205241	
Sacramento	2020	SBUS	Aggregated	55	GAS	296.7958153	0.038540199	0.056237767	1.178819758	0.421399606	438.8925144	0.000633618	0.0080	0.7448	0.000582589	0.002	0.3192	0.753433618	0.321782589	0.00439998	0.01570885	
Sacramento	2020	UBUS	Aggregated	55	DSL	1016.234722	0.234324872	1.273209142	4.176709576	9.628789841	1439.430373	0.062135332	0.0120	0.8418	0.059447385	0.003	0.36078	0.915955332	0.423227385	0.016905137	0.015836048	
Sacramento	2020	UBUS	Aggregated	55	GAS	774.6555107	0.12887549	0.187899076	2.837997439	1.068186092	938.5852904	0.000673323	0.0120	0.1303	0.000619172	0.003	0.05586	0.143013323	0.059479172	0.009415972	0.051764666	
Sacramento	2020	MCY	Aggregated	55	GAS	29772.03749	1.947261382	2.352815596	20.33742128	1.172175098	147.2136132	0.001482949	0.0040	0.0118	0.001393018	0.001	0.00504	0.017242949	0.007433018	0.001859378	0.340446143	
Sacramento	2020	LDA	Aggregated	60	DSL	20753.66468	0.018420305	0.020970292	0.18734267	0.133803183	255.707041	0.012930424	0.0080	0.0368	0.012371059	0.002	0.01575	0.057680424	0.030121059	0.002440448	0.000855588	
Sacramento	2020	LDA	Aggregated	60	GAS	2036138.564	0.010704126	0.015594731	0.550990641	0.060930272	265.7369626	0.001401673	0.0080	0.0367	0.00128887	0.002	0.01575	0.046151673	0.01903887	0.00259525	0.004165972	
Sacramento	2020	LDT1	Aggregated	60	DSL	437.1148178	0.132565733	0.150917273	1.226188972	1.321393278	364.0423551	0.091647878	0.0080	0.0367	0.087683232	0.002	0.01575	0.136397878	0.105433232	0.003474391	0.006157423	
Sacramento	2020	LDT1	Aggregated	60	GAS	156149.9934	0.026975348	0.039234284	1.32349731	0.160717717	315.8716168	0.002149484	0.0080	0.0368	0.001976885	0.002	0.01575	0.046899484	0.019726885	0.003099977	0.010451107	
Sacramento	2020	LDT2	Aggregated	60	DSL	1318.159289	0.010301272	0.011727313	0.090424959	0.062686523	329.6789753	0.005736425	0.0080	0.0368	0.005488269	0.002	0.01575	0.050486425	0.023238269	0.00314643	0.000478474	
Sacramento	2020	LDT2	Aggregated	60	GAS	778715.0821	0.014227225	0.020737947	0.722264017	0.099835832	358.2754401	0.00136954	0.0080	0.0368	0.001259325	0.002	0.01575	0.04611954	0.019009325	0.003501649	0.005554372	
Sacramento	2020	HHDT	Aggregated	60	DSL	44874.56211	0.043366091	0.049368993	0.196755406	3.029548829	1404.497177	0.019987159	0.0360	0.0617	0.019122523	0.009	0.02646	0.117727159	0.054582523	0.013892601	0.001964655	
Sacramento	2020	HHDT	Aggregated	60	GAS	486.0755814	0.448303669	0.638109052	29.17727739	3.377490399	1609.285524	0.000745696	0.0200	0.0617	0.00069008	0.005	0.02646	0.082485696	0.03215008	0.016531557	0.164869988	
Sacramento	2020	MDV	Aggregated	60	DSL	7687.031087	0.008932611	0.010169184	0.119842138	0.050648591	432.9535902	0.00607262	0.0080	0.0368	0.005809921	0.002	0.01575	0.05082262	0.023559921	0.004132075	0.000414903	
Sacramento	2020	MDV	Aggregated	60	GAS	466057.209	0.03370012	0.046935635	1.345648018	0.197718902	481.9088633	0.001457945	0.0080	0.0367	0.001342248	0.002	0.01575	0.046207945	0.019092248	0.004717709	0.011215282	
Sacramento	2020	MH	Aggregated	60	DSL	1276.528255	0.071524549	0.081425943	0.341299789	4.93334794	906.3052727	0.163834754	0.0160	0.1303	0.156747335	0.004	0.05586	0.310174754	0.216607335	0.008649706	0.003322178	
Sacramento	2020	MH	Aggregated	60	GAS	4286.468096	0.129078834	0.180409821	4.80487048	0.746370501	944.8394084	0.001748154	0.0120	0.1303	0.001612532	0.003	0.05586	0.144088154	0.060472532	0.009508595	0.044513564	
Sacramento	2020	MHDT	Aggregated	60	DSL	101301.9264	0.055267258	0.062917566	0.240605763	1.894753204	1029.848243	0.066695905	0.0120	0.1303	0.063810669	0.003	0.05586	0.209035905	0.122670669	0.009825231	0.00256702	
Sacramento	2020	MHDT	Aggregated	60	GAS	13937.94614	0.089759333	0.130976608	2.504067308	0.718671347	939.6827088	0.000783708	0.0120	0.1303	0.000720591	0.003	0.05586	0.143123708	0.059580591	0.009419924	0.036072475	
Sacramento	2020	OBUS	Aggregated	60	DSL	7355.220409	0.038219847	0.043510386	0.148303984	3.159946225	1278.207578	0.01883864	0.0120	0.1303	0.018023689	0.003	0.05586	0.16117864	0.076883689	0.011967335	0.001725324	
Sacramento	2020	OBUS	Aggregated	60	GAS	5710.308454	0.050023172	0.072982701	1.350073633	0.462979321	931.0773026	0.000635758	0.0120	0.1303	0.000584563	0.003	0.05586	0.142975758	0.059444563	0.009314363	0.020105591	
Sacramento	2020	SBUS	Aggregated	60	DSL	404.3787479	0.045200416	0.051457233	0.137194956	5.919237467	1030.978653	0.033416203	0.0120	0.7448	0.031970633	0.003	0.3192	0.790216203	0.354170633	0.009836015	0.002099442	
Sacramento	2020	SBUS	Aggregated	60	GAS	165.1808094	0.041528558	0.060598374	1.106151665	0.427426778	441.6192766	0.00068071	0.0080	0.7448	0.000625887	0.002	0.3192	0.75348071	0.321825887	0.004426114	0.016876353	
Sacramento	2020	UBUS	Aggregated	60	DSL	1538.212915	0.26790093	1.468371849	4.187425871	9.819427889	1441.753679	0.066421447	0.0120	0.8418	0.063548085	0.003	0.36078	0.920241447	0.427328085	0.016932423	0.016893728	
Sacramento	2020	UBUS	Aggregated	60	GAS	1172.549103	0.139429322	0.203284385	2.764212577	1.09096907	944.4165561	0.000724858	0.0120	0.1303	0.000666564	0.003	0.05586	0.143064858	0.059526564	0.00947347	0.056029551	
Sacramento	2020	MCY	Aggregated	60	GAS	22983.62562	2.132872604	2.575895691	23.1683072	1.219027859	158.3983823	0.001612141	0.0040	0.0118	0.001514467	0.001	0.00504	0.017372141	0.007554467	0.002018236	0.36952232	
Sacramento	2020	LDA	Aggregated	65	DSL	3042.460738	0.020446907	0.023277444	0.214122685	0.137873988	287.4664658	0.014450101	0.0080	0.0368	0.013824996	0.002	0.01575	0.059200101	0.031574996	0.002743557	0.000949719	
Sacramento	2020	LDA	Aggregated	65	GAS	298495.3131	0.012197913	0.017770763	0.534127989	0.063060743	299.1773989	0.00158466	0.0080	0.0367	0.001457132	0.002	0.01575	0.04633466	0.019207132	0.002896936	0.004692125	
Sacramento	2020	LDT1	Aggregated	65	DSL	64.08047405	0.151779704	0.172791102	1.533595261	1.367800618	408.9014905	0.104986282	0.0080	0.0367	0.100444622	0.002	0.01575	0.149736282	0.118194622	0.003902523	0.007049875	
Sacramento	2020	LDT1	Aggregated	65	GAS	22891.38961	0.030169335	0.043875972	1.338136901	0.170837094	355.4540838	0.002400745	0.0080	0.0368	0.002207985	0.002	0.01575	0.047150745	0.019957985	0.003459564	0.011567076	
Sacramento	2020	LDT2	Aggregated	65	DSL	193.2404684	0.010890187	0.012397754	0.099086149	0.064203628	370.3036816	0.006172254	0.0080	0.0368	0.005905245	0.002	0.01575	0.050922254	0.023655245	0.003534149	0.000505828	
Sacramento	2020	LDT2	Aggregated	65	GAS	114158.6365	0.016161134	0.023556587	0.700428166	0.103963506	403.2522743	0.0015473	0.0080	0.0368	0.001422781	0.002	0.01575	0.0462973	0.019172781	0.003908757	0.006237124	
Sacramento	2020	HHDT	Aggregated	65	DSL	24578.69879	0.043366091	0.049368993	0.196755406	3.030096316	1404.497177	0.019987159	0.0360	0.0617	0.019122523	0.009	0.02646	0.117727159	0.054582523	0.013892601	0.001964655	

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2020	HHDT	Aggregated	65	GAS	260.5264518	0.508655292	0.723691759	29.14363197	3.511769883	1604.896563	0.000848734	0.0200	0.0617	0.000785473	0.005	0.02646	0.082588734	0.032245473	0.016490569	0.187231074	
Sacramento	2020	MDV	Aggregated	65	DSL	1126.90894	0.009507129	0.010823235	0.127238676	0.051744686	486.1461977	0.006547377	0.0080	0.0368	0.00626414	0.002	0.01575	0.051297377	0.02401414	0.004639741	0.000441588	
Sacramento	2020	MDV	Aggregated	65	GAS	68323.39164	0.0382256	0.053236173	1.364831844	0.207074636	542.3497622	0.001645172	0.0080	0.0367	0.00151465	0.002	0.01575	0.046395172	0.01926465	0.00526627	0.012586674	
Sacramento	2020	MH	Aggregated	65	DSL	200.8892527	0.082053882	0.09341289	0.363449485	5.040011054	919.7432154	0.192032378	0.0160	0.1303	0.183725142	0.004	0.05586	0.338372378	0.243585142	0.008777956	0.003811245	
Sacramento	2020	MH	Aggregated	65	GAS	669.8149009	0.148355866	0.207604232	5.723552214	0.760966249	962.3545485	0.001990707	0.0120	0.1303	0.001836311	0.003	0.05586	0.144330707	0.060696311	0.009698084	0.050843762	
Sacramento	2020	MHDT	Aggregated	65	DSL	15942.04297	0.055267258	0.062917566	0.240605763	1.889598408	1029.848243	0.066695905	0.0120	0.1303	0.063810669	0.003	0.05586	0.209035905	0.122670669	0.009825231	0.00256702	
Sacramento	2020	MHDT	Aggregated	65	GAS	2177.980519	0.102899951	0.150151367	2.571234673	0.733597332	957.1022556	0.000889788	0.0120	0.1303	0.000818127	0.003	0.05586	0.143229788	0.059678127	0.009595	0.040999401	
Sacramento	2020	OBUS	Aggregated	65	DSL	977.8671276	0.036306693	0.041332406	0.138528956	3.076388823	1235.76011	0.018371352	0.0120	0.1303	0.017576616	0.003	0.05586	0.160711352	0.076436616	0.011967335	0.001725324	
Sacramento	2020	OBUS	Aggregated	65	GAS	892.3079806	0.057198143	0.083451108	1.317243085	0.472660469	948.3373251	0.000720861	0.0120	0.1303	0.000662813	0.003	0.05586	0.143060861	0.059522813	0.00948622	0.022810377	
Sacramento	2020	SBUS	Aggregated	65	DSL	0	0	0	0	0	0	0	0.0120	0.7448	0	0.003	0.3192	0.7568	0.3222	0.009836015	0.002099442	
Sacramento	2020	UBUS	Aggregated	65	DSL	231.4978066	0.32167571	1.782137868	4.430910415	10.08370314	1463.130806	0.073379361	0.0120	0.8418	0.070205002	0.003	0.36078	0.927199361	0.433985002	0.017183482	0.018876702	
Sacramento	2020	UBUS	Aggregated	65	GAS	176.4661724	0.160084929	0.233403849	2.772678935	1.11693535	961.9238575	0.000822555	0.0120	0.1303	0.000756405	0.003	0.05586	0.143162555	0.059616405	0.00964885	0.063789231	
Sacramento	2020	MCY	Aggregated	65	GAS	3369.370164	2.418035526	2.920441467	27.36174077	1.250792062	176.8925558	0.001840199	0.0040	0.0118	0.001728769	0.001	0.00504	0.017600199	0.007768769	0.002282284	0.42139962	
Sacramento	2020	LDA	Aggregated	70	DSL	804.9468625	0.021859892	0.024886034	0.232867258	0.140439749	310.4183259	0.015509649	0.0080	0.0368	0.014838708	0.002	0.01575	0.060259649	0.032588708	0.002962608	0.00101535	
Sacramento	2020	LDA	Aggregated	70	GAS	78973.20177	0.012854434	0.018726485	0.503311658	0.066165792	314.6774805	0.001718762	0.0080	0.0367	0.001580442	0.002	0.01575	0.046468762	0.019330442	0.003103692	0.005078275	
Sacramento	2020	LDT1	Aggregated	70	DSL	16.95383473	0.165176051	0.188041953	1.748763157	1.396264773	441.1656163	0.114286071	0.0080	0.0367	0.109342106	0.002	0.01575	0.159036071	0.127092106	0.00421045	0.00767211	
Sacramento	2020	LDT1	Aggregated	70	GAS	6056.39771	0.031612881	0.045969709	1.308722243	0.182671421	374.276299	0.002586131	0.0080	0.0368	0.002378492	0.002	0.01575	0.047336131	0.020128492	0.003706084	0.01239487	
Sacramento	2020	LDT2	Aggregated	70	DSL	51.12582285	0.01130079	0.012865198	0.105148518	0.065209216	399.5222706	0.006476123	0.0080	0.0368	0.006195968	0.002	0.01575	0.051226123	0.023945968	0.003813009	0.0005249	
Sacramento	2020	LDT2	Aggregated	70	GAS	30203.06397	0.017010636	0.024793961	0.661633563	0.109568915	424.4090111	0.00167766	0.0080	0.0368	0.001542651	0.002	0.01575	0.04642766	0.019292651	0.004187758	0.00673968	
Sacramento	2020	HHDT	Aggregated	70	DSL	0	0	0	0	0	0	0	0.0360	0.0617	0	0.009	0.02646	0.09774	0.03546	0.013892601	0.001964655	
Sacramento	2020	MDV	Aggregated	70	DSL	298.1474188	0.009907694	0.011279251	0.132415856	0.052491853	523.3444876	0.006878387	0.0080	0.0368	0.006580831	0.002	0.01575	0.051628387	0.024330831	0.004994758	0.000460193	
Sacramento	2020	MDV	Aggregated	70	GAS	18076.38766	0.040662075	0.056495739	1.344560034	0.218976191	570.9419236	0.001782235	0.0080	0.0367	0.00164085	0.002	0.01575	0.046532235	0.01939085	0.005642256	0.013593901	
Sacramento	2020	MHDT	Aggregated	70	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.009825231	0.00256702	
Sacramento	2020	OBUS	Aggregated	70	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.011967335	0.001725324	
Sacramento	2020	SBUS	Aggregated	70	DSL	0	0	0	0	0	0	0	0.0120	0.7448	0	0.003	0.3192	0.7568	0.3222	0.009836015	0.002099442	
Sacramento	2020	MCY	Aggregated	70	GAS	891.4376144	2.673691985	3.227608343	31.07335668	1.306876179	189.5606282	0.002002288	0.0040	0.0118	0.001881059	0.001	0.00504	0.017762288	0.007921059	0.002465551	0.458411317	
Sacramento	2020	HHDT	Aggregated	75	DSL	0	0	0	0	0	0	0	0.0360	0.0617	0	0.009	0.02646	0.09774	0.03546	0.013892601	0.001964655	
Sacramento	2020	MHDT	Aggregated	75	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.009825231	0.00256702	
Sacramento	2020	OBUS	Aggregated	75	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.011967335	0.001725324	
Sacramento	2020	SBUS	Aggregated	75	DSL	0	0	0	0	0	0	0	0.0120	0.7448	0	0.003	0.3192	0.7568	0.3222	0.009836015	0.002099442	
Sacramento	2020	HHDT	Aggregated	80	DSL	0	0	0	0	0	0	0	0.0360	0.0617	0	0.009	0.02646	0.09774	0.03546	0.013892601	0.001964655	
Sacramento	2020	MHDT	Aggregated	80	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.009825231	0.00256702	
Sacramento	2020	OBUS	Aggregated	80	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.011967335	0.001725324	
Sacramento	2020	SBUS	Aggregated	80	DSL	0	0	0	0	0	0	0	0.0120	0.7448	0	0.003	0.3192	0.7568	0.3222	0.009836015	0.002099442	
Sacramento	2020	HHDT	Aggregated	85	DSL	0	0	0	0	0	0	0	0.0360	0.0617	0	0.009	0.02646	0.09774	0.03546	0.013892601	0.001964655	
Sacramento	2020	MHDT	Aggregated	85	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.009825231	0.00256702	
Sacramento	2020	OBUS	Aggregated	85	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.011967335	0.001725324	
Sacramento	2020	SBUS	Aggregated	85	DSL	0	0	0	0	0	0	0	0.0120	0.7448	0	0.003	0.3192	0.7568	0.3222	0.009836015	0.002099442	
Sacramento	2020	HHDT	Aggregated	90	DSL	0	0	0	0	0	0	0	0.0360	0.0617	0	0.009	0.02646	0.09774	0.03546	0.013892601	0.001964655	
Sacramento	2020	MHDT	Aggregated	90	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.009825231	0.00256702	
Sacramento	2020	OBUS	Aggregated	90	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.011967335	0.001725324	
Sacramento	2020	SBUS	Aggregated	90	DSL	0	0	0	0	0	0	0	0.0120	0.7448	0	0.003	0.3192	0.7568	0.3222	0.009836015	0.002099442	
Sacramento	2040	LDA	Aggregated	5	DSL	13.08985643	0.080134421	0.091227711	2.596701728	0.043678988	475.000383	0.001835643	0.0080	0.0368	0.001756234	0.002	0.01575	0.046585643	0.019506234	0.004533366	0.00372209	
Sacramento	2040	LDA	Aggregated	5	GAS	945.2761522	0.025937658	0.037848169	0.566120973	0.040555886	628.4735388	0.00527369	0.0080	0.0367	0.004848964	0.002	0.01575	0.05002369	0.022598964	0.006096207	0.010079799	
Sacramento	2040	LDT1	Aggregated	5	DSL	0.03990852	0.270897128	0.308398369	2.723045571	0.230246943	546.3877782	0.024636826	0.0080	0.0368	0.023571048	0.002	0.01575	0.069386826	0.041321048	0.005214682	0.01258265	
Sacramento	2040	LDT1	Aggregated	5	GAS	65.65200897	0.030737218	0.044851676	0.625580098	0.046905624	679.2751824	0.005574464	0.0080	0.0367	0.005125513	0.002	0.01575	0.050324464	0.022875513	0.006595602	0.01195546	
Sacramento	2040	LDT2	Aggregated	5	DSL	0.907976136	0.263861778	0.300389092	2.68708633	0.152592218	582.9985477	0.009273406	0.0080	0.0368	0.008872243	0.002	0.01575	0.054023406	0.026622243	0.005564092	0.012255872	
Sacramento	2040	LDT2	Aggregated	5	GAS	415.0097639	0.0349306	0.05097065	0.758405211	0.051090064	787.169544	0.005458703	0.0080	0.0368	0.005019076	0.002	0.01575	0.050208703	0.022769076	0.006348136	0.013587084	
Sacramento	2040	HHDT	Aggregated	5	DSL	6340.662475	0.394797537	2.445012649	8.984886345	12.52302215	3846.830435	0.010398204	0.0360	0.0617	0.009948382	0.009	0.02646	0.108138204	0.045408382	0.027306395	0.023619152	
Sacramento	2040	HHDT	Aggregated	5	GAS	35.26815634	2.094526332	3.056327907	54.10482019	5.691885207	3790.392608	0.007760515	0.0200	0.0617	0.007135507	0.005	0.02646	0.089500515	0.038595507	0.038757328	0.842173854	
Sacramento	2040	LHDT1	Aggregated	5	DSL	5096.70896	0.764278901	0.870080716	3.527029263	0.559982307	1139.958966	0.023279447	0.0120	0.0764	0.022272388	0.003	0.03276	0.111719447	0.058032388	0.010879678	0.035499284	
Sacramento	2040	LHDT1	Aggregated	5	GAS	4742.627043	0.029335917	0.042806901	0.256604686	0.116645207	1301.185233	0.007461216	0.0080	0.0764	0.006860313	0.002	0.03276	0.091901216	0.041620313	0.012989659	0.011702205	
Sacramento	2040	LHDT2	Aggregated	5	DSL	2484.334281	0.745079586	0.848223572	3.322032895	0.271491954	1187.405469	0.016335859	0.0120	0.0892	0.015629177	0.003	0.03822	0.117515859	0.056849177	0.011332504	0.034607513	
Sacramento	2040	LHDT2	Aggregated	5	GAS	1626.79577	0.021499871	0.031372561	0.214704845	0.061148482	1369.961961	0.007718943	0.0080	0.0892	0.007097283	0.002	0.03822	0.104898943	0.047317283	0.013674999	0.008576377	
Sacramento	2040	MDV	Aggregated	5	DSL	5.503617883	0.093927313	0.106930001	2.956155679	0.050566433	719.6473609	0.002297495	0.0080	0.0367	0.002198106	0.002	0.01575	0.047047495	0.019948106	0.006868257	0.004362743	
Sacramento	2040	MDV	Aggregated	5	GAS	197.2945131	0.049531791	0.072276673	0.934599636	0.073545286	1042.292717	0.005841354	0.0080	0.0367	0.005370909	0.002	0.01575	0.050591354	0.023120909	0.007585446	0.019270495	
Sacramento	2040	MH	Aggregated	5	DSL	44.7659571	0.780662142	0.888731947	2.130351442	10.92985492	1999.515396	0.061026605	0.0160	0.1303	0.058386621	0.004	0.05586	0.207366605	0.118246621	0.019083216	0.036260254	
Sacramento	2040	MH	Aggregated	5	GAS	170.6865983	0.069683609	0.101682159	0.378634753	0.210080572	3676.853766	0.007600139	0.0120	0.1303	0.006988047	0.003	0.05586	0.149940139	0.065848047	0.036699924	0.027869149	
Sacramento	2040	MHDT	Aggregated	5	DSL	6411.90724	0.235485798	0.268082655	1.234192296	9.86589547	2112.159173	0.005892241	0.0120	0.1303	0.005637346	0.003	0.05586	0.148232241	0.064497346	0.02015098	0.010937702	
Sacramento	2040	MHDT	Aggregated	5	GAS	631.0176316	0.068233763	0.099566547	0.39607149	0.179593079	3659.180465	0.007683866	0.0120	0.1303	0.007065031	0.003	0.05586	0.150023866	0.065925031	0.036523773	0.0272893	
Sacramento	2040	OBUS	Aggregated	5	DSL	345.0674449	0.374461229	0.426295605	2.122869239	14.22154158	2531.084598	0.007904119	0.0120	0.1303	0.007562191	0.003	0.05586	0.150244119	0.066422191	0.024521995	0.017938126	
Sacramento	2040	OBUS	Aggregated	5	GAS	338.2459458	0.073032669	0.106569099	0.422705879	0.187397763	3661.144475	0.007734664	0.0120	0.1303	0.007111738	0.003	0.05586	0.150074664	0.065971738	0.036543988	0.029208566	
Sacramento	2040	SBUS	Aggregated	5	DSL	159.6208102	0.22916815	0.260890495	1.19142163	9.327660624	2119.03667	0.005664487	0.0120	0.7448	0.005419444	0.003	0.3192	0.762464487	0.327619444	0.020216595	0.010644264	
Sacramento	2040	SBUS	Aggregated	5	GAS	110.2803891	0.057258278	0.083551145	0.319747625	0.158057123	1735.049551	0.007588695	0.0080	0.7448	0.006977525	0.002	0.3192	0.760388695	0.328177525	0.017321381	0.023038211	
Sacramento	2040	UBUS	Aggregated	5	DSL	430.9872589	0.533608035	10.68408227	40.51035363	3.632389222	2922.580991	0.018683933	0.0120	0.8418	0.017875674	0.003	0.36078	0.872503933	0.381655674	0.035383437	0.112506345	
Sacramento	2040	UBUS	Aggregated	5	GAS	435.0538259	0.168755309	0.24624735	1.277221292	0.771638839	3691.352804	0.007390661	0.0120	0.1303	0.00679544	0.003	0.05586	0.149730661	0.06565544	0.036862793	0.067623086	
Sacramento	2040	MCY	Aggregated	5	GAS	10.46217626	12.62685938	15.83632682	44.02562561	1.665304556	566.8135944	0.013619668	0.0040	0.0118	0.012697948	0.001	0.00504	0.029379668	0.018737948	0.006805365	2.719764024	
Sacramento	2040	LDA	Aggregated	10	DSL	997.7960969	0.059978292	0.068281298	1.94381459	0.036409361	395.720155	0.001697337	0.0080	0.0368	0.001623911	0.002	0.01575	0.046447337	0.019373911	0.003776722	0.002785876	
Sacramento	2040	LDA	Aggregated	10	GAS	72055.24832	0.016492453	0.024065749	0.523299457	0.035048569	469.3466827	0.003318227	0.0080	0.0367	0.003050987	0.002	0.01575	0.048068227	0.020800987	0.004523017	0.006342894	
Sacramento	2040	LDT1	Aggregated	10	DSL	3.04209341	0.201415624	0.229298297	2.030016692	0.210891975	459.930942	0.019240509	0.0080	0.0368	0.018408173	0.002	0.01575	0.063990509	0.036158173	0.004389544	0.009355368	
Sacramento	2040	LDT1	Aggregated	10	GAS	5004.433676	0.019579349	0.02857014	0.577567464	0.040453579	507.1769237	0.003508171	0.0080	0.0367	0.003225634	0.002	0.01575	0.048258171	0.020975634	0.004893556	0.007538147	
Sacramento	2040	LDT2	Aggregated	10	DSL	69.21199247	0.197520268	0.224863693	2.011505422	0.126775545	490.7486623	0.008701847	0.0080	0.0368	0.008325409	0.002	0.01575	0.053451847	0.026075409	0.004683666	0.009174436	

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2040	LDT2	Aggregated	10	GAS	31634.81013	0.022219509	0.032422656	0.700609806	0.044107702	587.7271239	0.00343482	0.0080	0.0368	0.00315819	0.002	0.01575	0.04818482	0.02090819	0.004710314	0.008554957
Sacramento	2040	HHDT	Aggregated	10	DSL	21054.06956	0.346480438	1.561660351	5.940428353	10.63971379	3153.163625	0.009402446	0.0360	0.0617	0.0089957	0.009	0.02646	0.107142446	0.0444557	0.024217811	0.019112451
Sacramento	2040	HHDT	Aggregated	10	GAS	172.3736826	1.321715872	1.928644698	49.41152498	4.912842781	3215.241703	0.004882898	0.0200	0.0617	0.004489644	0.005	0.02646	0.086622898	0.035949644	0.032909568	0.529893764
Sacramento	2040	LHDT1	Aggregated	10	DSL	16948.88025	0.569365361	0.648184609	2.631559444	0.530715795	958.3133775	0.019316472	0.0120	0.0764	0.01848085	0.003	0.03276	0.107756472	0.05424085	0.009146067	0.026445925
Sacramento	2040	LHDT1	Aggregated	10	GAS	12366.78359	0.018462713	0.026940747	0.23373766	0.101173147	1279.824063	0.004694579	0.0080	0.0764	0.004316492	0.002	0.03276	0.089134579	0.039076492	0.012775684	0.007362999
Sacramento	2040	LHDT2	Aggregated	10	DSL	8261.543785	0.557526406	0.634706746	2.486084598	0.231039544	1055.284338	0.01512903	0.0120	0.0892	0.014474555	0.003	0.03822	0.11630903	0.055694555	0.01007155	0.025896028
Sacramento	2040	LHDT2	Aggregated	10	GAS	4242.001541	0.013531056	0.019744486	0.195571674	0.053037622	1421.961951	0.00485674	0.0080	0.0892	0.004465593	0.002	0.03822	0.10203674	0.044685593	0.014193271	0.005396236
Sacramento	2040	MDV	Aggregated	10	DSL	419.5224351	0.070308413	0.080041454	2.212929325	0.042058872	611.1557843	0.002145227	0.0080	0.0367	0.002052426	0.002	0.01575	0.046895227	0.019802426	0.005832822	0.00326569
Sacramento	2040	MDV	Aggregated	10	GAS	15039.1027	0.031608178	0.04612258	0.862172962	0.063072497	778.1917543	0.003676786	0.0080	0.0367	0.003380669	0.002	0.01575	0.048426786	0.021130669	0.005628421	0.012173017
Sacramento	2040	MH	Aggregated	10	DSL	222.8280705	0.584806176	0.665762951	1.608635334	9.086166731	1815.568573	0.054656473	0.0160	0.1303	0.052292058	0.004	0.05586	0.200996473	0.112152058	0.017327642	0.027163121
Sacramento	2040	MH	Aggregated	10	GAS	858.0430338	0.043822132	0.063945151	0.34465059	0.182702052	3138.795399	0.004781989	0.0120	0.1303	0.004396862	0.003	0.05586	0.147121989	0.063256862	0.031329056	0.017535201
Sacramento	2040	MHDT	Aggregated	10	DSL	31916.05879	0.19067069	0.217064067	0.999587262	7.485927484	1872.876793	0.005288524	0.0120	0.1303	0.005059744	0.003	0.05586	0.147628524	0.063919744	0.017868115	0.008856157
Sacramento	2040	MHDT	Aggregated	10	GAS	3172.131194	0.042910362	0.0626147	0.360522302	0.156187807	3123.708349	0.00483467	0.0120	0.1303	0.0044453	0.003	0.05586	0.14717467	0.0633053	0.031178712	0.017170362
Sacramento	2040	OBUS	Aggregated	10	DSL	1711.893329	0.30288285	0.344809069	1.716751053	10.77495904	2242.837748	0.007104318	0.0120	0.1303	0.006796989	0.003	0.05586	0.149444318	0.065656989	0.021743229	0.01452799
Sacramento	2040	OBUS	Aggregated	10	GAS	1700.36535	0.045928264	0.067018415	0.384766135	0.162975354	3125.384952	0.004866632	0.0120	0.1303	0.004474688	0.003	0.05586	0.147206632	0.063334688	0.031195946	0.01837796
Sacramento	2040	SBUS	Aggregated	10	DSL	559.4627583	0.185591833	0.211282174	0.964918202	7.076378381	1878.96672	0.005095693	0.0120	0.7448	0.004875255	0.003	0.3192	0.761895693	0.327075255	0.017926216	0.008620257
Sacramento	2040	SBUS	Aggregated	10	GAS	386.5271113	0.036111075	0.052693195	0.291858554	0.1367515	1481.148257	0.004774788	0.0080	0.7448	0.004390242	0.002	0.3192	0.757574788	0.325590242	0.014786367	0.014495587
Sacramento	2040	UBUS	Aggregated	10	DSL	1427.599746	0.401696448	8.011630759	30.5812176	2.980949492	2653.716102	0.015466417	0.0120	0.8418	0.014797347	0.003	0.36078	0.869286417	0.378577347	0.032128313	0.084847231
Sacramento	2040	UBUS	Aggregated	10	GAS	1441.069819	0.106182881	0.154941811	1.163196144	0.670446619	3151.172697	0.004650186	0.0120	0.1303	0.004275675	0.003	0.05586	0.146990186	0.063135675	0.031467947	0.042548283
Sacramento	2040	MCY	Aggregated	10	GAS	797.4968019	8.160402264	10.2333136	33.8277301	1.484803283	420.4229332	0.008762659	0.0040	0.0118	0.008169758	0.001	0.00504	0.024522659	0.014209758	0.005024393	1.760406979
Sacramento	2040	LDA	Aggregated	15	DSL	3163.919904	0.029317502	0.033376027	0.949413667	0.024607399	325.4787013	0.001468823	0.0080	0.0368	0.001405283	0.002	0.01575	0.046218823	0.019155283	0.003106343	0.001361742
Sacramento	2040	LDA	Aggregated	15	GAS	228480.5834	0.010935697	0.015957343	0.476691998	0.030882237	361.0321597	0.002202581	0.0080	0.0367	0.002025192	0.002	0.01575	0.046952581	0.019775192	0.003483012	0.004210709
Sacramento	2040	LDT1	Aggregated	15	DSL	9.646199179	0.102734348	0.116956225	1.031804964	0.176804901	381.3585516	0.015173863	0.0080	0.0368	0.014517448	0.002	0.01575	0.059923863	0.032267448	0.003639656	0.004771813
Sacramento	2040	LDT1	Aggregated	15	GAS	15868.60017	0.013007317	0.018980246	0.525816535	0.035595296	390.1418669	0.002329102	0.0080	0.0367	0.002141524	0.002	0.01575	0.047079102	0.019891524	0.003768365	0.005013624
Sacramento	2040	LDT2	Aggregated	15	DSL	219.4648799	0.096461004	0.10981444	0.982323885	0.084922221	406.9115207	0.007583336	0.0080	0.0368	0.007255285	0.002	0.01575	0.052333336	0.025005285	0.003883531	0.004480428
Sacramento	2040	LDT2	Aggregated	15	GAS	100311.0813	0.014741743	0.021511117	0.638126047	0.038840675	452.1052455	0.002280089	0.0080	0.0368	0.002096457	0.002	0.01575	0.047030089	0.019846457	0.003627543	0.005682365
Sacramento	2040	HHDT	Aggregated	15	DSL	21633.6388	0.270908634	0.671196669	2.814187326	7.372662846	2327.631525	0.008047834	0.0360	0.0617	0.007699689	0.009	0.02646	0.105787834	0.043159689	0.020315122	0.01341549
Sacramento	2040	HHDT	Aggregated	15	GAS	187.9762145	0.878416077	1.281782677	45.17658885	4.33042727	2319.381416	0.003241151	0.0200	0.0617	0.002980119	0.005	0.02646	0.084981151	0.034440119	0.023884255	0.351730838
Sacramento	2040	LHDT1	Aggregated	15	DSL	36706.41915	0.286836441	0.326544218	1.3270383	0.47484573	625.8588287	0.015794687	0.0120	0.0764	0.015111416	0.003	0.03276	0.104234687	0.050871416	0.005973147	0.013323001
Sacramento	2040	LHDT1	Aggregated	15	GAS	28160.83376	0.012277832	0.017915783	0.213836764	0.089142067	889.0773208	0.00311615	0.0080	0.0764	0.002865185	0.002	0.03276	0.08755615	0.037625185	0.00887587	0.004887383
Sacramento	2040	LHDT2	Aggregated	15	DSL	17892.13709	0.272979313	0.310768799	1.217600356	0.164910487	702.4710511	0.013102209	0.0120	0.0892	0.012535414	0.003	0.03822	0.114282209	0.053755414	0.006704328	0.012679364
Sacramento	2040	LHDT2	Aggregated	15	GAS	9659.609497	0.008998246	0.01313022	0.178920307	0.046730614	1000.291865	0.003223788	0.0080	0.0892	0.002964154	0.002	0.03822	0.100403788	0.043184154	0.009984996	0.003581893
Sacramento	2040	MDV	Aggregated	15	DSL	1330.267162	0.034346029	0.039100671	1.080673723	0.028260048	518.3011462	0.001865104	0.0080	0.0367	0.00178442	0.002	0.01575	0.046615104	0.01953442	0.004946625	0.001595307
Sacramento	2040	MDV	Aggregated	15	GAS	47687.61526	0.021035658	0.030695183	0.784483119	0.055265116	598.6206231	0.00244146	0.0080	0.0367	0.002244833	0.002	0.01575	0.04719146	0.019994833	0.004334624	0.008110524
Sacramento	2040	MH	Aggregated	15	DSL	300.7405544	0.28682356	0.326529554	0.811644492	6.101714449	1490.739181	0.043562668	0.0160	0.1303	0.041678166	0.004	0.05586	0.189902668	0.101538166	0.014227496	0.013322402
Sacramento	2040	MH	Aggregated	15	GAS	1083.855474	0.029204756	0.042615512	0.315954919	0.160142975	2163.577397	0.00317417	0.0120	0.1303	0.002918532	0.003	0.05586	0.14551417	0.061778532	0.021596327	0.011639448
Sacramento	2040	MHDT	Aggregated	15	DSL	43075.60171	0.134157861	0.152728512	0.703961057	4.480687195	1571.302609	0.004517231	0.0120	0.1303	0.004321818	0.003	0.05586	0.146857231	0.063181818	0.014990957	0.006231283
Sacramento	2040	MHDT	Aggregated	15	GAS	4006.945598	0.028597118	0.041728848	0.330505149	0.136902568	2153.177866	0.003209138	0.0120	0.1303	0.002950684	0.003	0.05586	0.145549138	0.061810684	0.02149275	0.011397276
Sacramento	2040	OBUS	Aggregated	15	DSL	2183.964218	0.208522723	0.237387247	1.177855408	6.336473112	1860.847832	0.006018545	0.0120	0.1303	0.005758186	0.003	0.05586	0.148358545	0.064618186	0.018242397	0.010231728
Sacramento	2040	OBUS	Aggregated	15	GAS	2147.852985	0.030608364	0.044663653	0.352730436	0.142852025	2154.333552	0.003230354	0.0120	0.1303	0.002970191	0.003	0.05586	0.145570354	0.061830191	0.021504711	0.012198851
Sacramento	2040	SBUS	Aggregated	15	DSL	1118.925517	0.130682396	0.14877196	0.679543193	4.246009239	1576.507378	0.00437897	0.0120	0.7448	0.004189538	0.003	0.3192	0.76117897	0.326389538	0.015040613	0.006069857
Sacramento	2040	SBUS	Aggregated	15	GAS	773.0542226	0.02396967	0.034976486	0.266515748	0.120744192	1020.958197	0.003169391	0.0080	0.7448	0.002914138	0.002	0.3192	0.755969391	0.324114138	0.010193249	0.009621825
Sacramento	2040	UBUS	Aggregated	15	DSL	2432.376768	0.202114534	3.948389551	15.40766034	2.002509955	2178.930956	0.01023511	0.0120	0.8418	0.009792343	0.003	0.36078	0.86405511	0.373572343	0.02638013	0.043006709
Sacramento	2040	UBUS	Aggregated	15	GAS	2455.327384	0.070513295	0.102892835	1.062656925	0.59147822	2172.109091	0.003086683	0.0120	0.1303	0.002838091	0.003	0.05586	0.145426683	0.061698091	0.021694849	0.028242535
Sacramento	2040	MCY	Aggregated	15	GAS	2528.789211	5.568654386	6.982248838	27.25983318	1.35530714	323.6589541	0.005946432	0.0040	0.0118	0.005544161	0.001	0.00504	0.021706432	0.011584161	0.003861739	1.201577735
Sacramento	2040	LDA	Aggregated	20	DSL	11863.92655	0.011433431	0.013016202	0.369441022	0.016449477	266.9982169	0.001248177	0.0080	0.0368	0.001194181	0.002	0.01575	0.045998177	0.018944181	0.00254821	0.000531061
Sacramento	2040	LDA	Aggregated	20	GAS	856746.3598	0.007626787	0.011128989	0.433682947	0.027724752	287.6789904	0.001542386	0.0080	0.0367	0.001418167	0.002	0.01575	0.046292386	0.019168167	0.002783744	0.00294886
Sacramento	2040	LDT1	Aggregated	20	DSL	36.17088993	0.044910737	0.051127888	0.447777911	0.154799476	313.315165	0.012207257	0.0080	0.0368	0.011679177	0.002	0.01575	0.056957257	0.029429177	0.002990255	0.002086017
Sacramento	2040	LDT1	Aggregated	20	GAS	59503.37324	0.009087661	0.013260693	0.478216861	0.0319256	310.9011193	0.001631261	0.0080	0.0367	0.001499885	0.002	0.01575	0.046381261	0.019249885	0.003011819	0.003517121
Sacramento	2040	LDT2	Aggregated	20	DSL	822.9396745	0.037519729	0.042713717	0.382072763	0.055957268	334.30888	0.00646885	0.0080	0.0368	0.006189011	0.002	0.01575	0.05121885	0.023939011	0.003190617	0.001742719
Sacramento	2040	LDT2	Aggregated	20	GAS	376142.0445	0.010287174	0.015011021	0.580562902	0.034855974	360.2813704	0.001596734	0.0080	0.0368	0.001468138	0.002	0.01575	0.046346734	0.019218138	0.002899484	0.003981504
Sacramento	2040	HHDT	Aggregated	20	DSL	98340.11113	0.199229982	0.27948357	1.352721193	4.180841776	1859.940604	0.006463862	0.0360	0.0617	0.006184238	0.009	0.02646	0.104203862	0.041644238	0.017727965	0.009673703
Sacramento	2040	HHDT	Aggregated	20	GAS	321.2481369	0.613109995	0.894648666	41.23480456	3.911372062	1873.910132	0.002269638	0.0200	0.0617	0.002086848	0.005	0.02646	0.084009638	0.033546848	0.019368558	0.246301892
Sacramento	2040	LHDT1	Aggregated	20	DSL	40242.09151	0.121514823	0.138336547	0.564295184	0.44068439	533.4501426	0.012993207	0.0120	0.0764	0.012431126	0.003	0.03276	0.101433207	0.048191126	0.005091206	0.00564413
Sacramento	2040	LHDT1	Aggregated	20	GAS	32539.62473	0.008578133	0.012517192	0.195360807	0.080278959	771.9149471	0.002182105	0.0080	0.0764	0.002006365	0.002	0.03276	0.086622105	0.036766365	0.00770628	0.003422423
Sacramento	2040	LHDT2	Aggregated	20	DSL	19615.56138	0.106978087	0.121787439	0.477620578	0.119284472	599.1561279	0.011138656	0.0120	0.0892	0.010656803	0.003	0.03822	0.112318656	0.051876803	0.005718299	0.004968926
Sacramento	2040	LHDT2	Aggregated	20	GAS	11161.60377	0.00628679	0.00917367	0.163461207	0.04208434	875.4251886	0.002257479	0.0080	0.0892	0.002075669	0.002	0.03822	0.099437479	0.042295669	0.008738612	0.002508245
Sacramento	2040	MDV	Aggregated	20	DSL	4988.176816	0.013370888	0.015221867	0.420307285	0.018714306	430.4470497	0.001588973	0.0080	0.0367	0.001520235	0.002	0.01575	0.046338973	0.019270235	0.004108152	0.000621052
Sacramento	2040	MDV	Aggregated	20	GAS	178816.905	0.014720263	0.021479773	0.713180681	0.049417664	477.0437131	0.001710215	0.0080	0.0367	0.00157248	0.002	0.01575	0.046460215	0.01932248	0.003464669	0.005698606
Sacramento	2040	MH	Aggregated	20	DSL	318.9462874	0.113813367	0.129568952	0.343242151	4.075988974	1223.32879	0.03466414	0.0160	0.1303	0.033164585	0.004	0.05586	0.18100414	0.093024585	0.011675353	0.005286412
Sacramento	2040	MH	Aggregated	20	GAS	1124.224306	0.020453079	0.029845085	0.289334125	0.143683131	1521.176107	0.002222734	0.0120	0.1303	0.002043722	0.003	0.05586	0.144562734	0.060903722	0.015185062	0.008150602
Sacramento	2040	MHDT	Aggregated	20	DSL	45683.24106	0.096964452	0.110386647	0.509235154	2.508390591	1372.322758	0.004007631	0.0120	0.1303	0.003834263	0.003	0.05586	0.146347631	0.062694263	0.013092597	0.004503746
Sacramento	2040	MHDT	Aggregated	20	GAS	4156.186637	0.020027529	0.029224124	0.302658425	0.122831424	1513.864366	0.002247221	0.0120	0.1303	0.002066237	0.003	0.05586	0.144587221	0.060926237	0.015112287	0.00798102
Sacramento	2040	OBUS	Aggregated	20	DSL	2329.191477	0.15120362	0.172133812	0.85439103	3.546234423	1627.48815	0.005377313	0.0120	0.1303	0.005144693	0.003	0.05586	0.147717313	0.064004693	0.015936458	0.007401853
Sacramento	2040	OBUS	Aggregated	20	GAS	2227.851029	0.021436073	0.031279467	0.32301112	0.128169383	1514.67691	0.002262077	0.0120	0.1303	0.002079896	0.003	0.05586	0.144602077	0.060939896	0.015120769	0.008542328
Sacramento	2040	SBUS	Aggregated	20	DSL	1518.759405	0.094522224	0.107606357	0.491580412	2.381563998	1377.278498	0.003906767	0.0120	0.7448	0.003737762	0.003	0.3192	0.760706767	0.325937762	0.013139877	0.004390311
Sacramento	2040	SBUS	Aggregated	20	GAS	1049.295376	0.016789043	0.024498532	0.244090499	0.108279951	717.8191166	0.002219387	0.0080	0.7448	0.002040645	0.002	0.3192	0.755019387	0.323240645	0.007167587	0.006737748
Sacramento	2040	UBUS	Aggregated	20	DSL	21308.81977	0.088187635	1.594030765	6.480389469	1.457142589	1788.071988	0.006608768	0.0120	0.8418	0.006322876	0.003	0.36078	0.860428768	0.370102876	0.021648034	0.019136462
Sacramento	2040	UBUS	Aggregated	20	GAS	21509.87848	0.049349506	0.072010683	0.972475598	0.531260397	1527.174603	0.00216147	0.0120	0.1303	0.001987392	0.003	0.05586	0.14450147	0.060847392	0.015256798	0.019777026
Sacramento	2040	MCY	Aggregated	20	GAS	9482.341646	4.009749646	5.026922915	22.8973821	1.261529226	258.6091883	0.004254845	0.0040	0.0118	0.003967062	0.001	0.00504	0.020014845	0.010007062	0.003086747	0.864511197
Sacramento	2040	LDA	Aggregated	25	DSL	38317.51721	0.00687726	0.007829303	0.221908589	0.012690841	223.8090274	0.001067406	0.0080	0.0368	0.001021231	0.002	0.01575	0.045817406	0.018771231	0.002136016	0.000319435
Sacramento	2040	LDA	Aggregated	25	GAS	2767076.586	0.00561897	0.008199187	0.396564051	0.025310271	238.1367222	0.001139431	0.0080	0.0367	0.001047665	0.002	0.01575	0.045889431	0.018797665	0.00230909	0.002178617

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2040	LDT1	Aggregated	25	DSL	116.822933	0.0289607	0.032969831	0.289894528	0.147323607	262.7034715	0.010095218	0.0080	0.0368	0.009658503	0.002	0.01575	0.054845218	0.027408503	0.002507221	0.001345169	
Sacramento	2040	LDT1	Aggregated	25	GAS	192181.0219	0.006705089	0.00978405	0.437174851	0.029126792	257.3744742	0.001205259	0.0080	0.0367	0.001108191	0.002	0.01575	0.045955259	0.018858191	0.002498284	0.002602135	
Sacramento	2040	LDT2	Aggregated	25	DSL	2657.889443	0.022528607	0.025647322	0.229417061	0.042553108	280.3059447	0.00554434	0.0080	0.0368	0.005304494	0.002	0.01575	0.05029434	0.023054494	0.002675218	0.00104641	
Sacramento	2040	LDT2	Aggregated	25	GAS	1214844.782	0.00758257	0.011064468	0.530874396	0.031812221	298.2542766	0.001179625	0.0080	0.0368	0.001084622	0.002	0.01575	0.045929625	0.018834622	0.002405253	0.002942777	
Sacramento	2040	HHDT	Aggregated	25	DSL	46576.35757	0.14770012	0.286016277	1.269121501	2.390506279	1794.614489	0.006392402	0.0360	0.0617	0.00611587	0.009	0.02646	0.104132402	0.04157587	0.016347927	0.007088833	
Sacramento	2040	HHDT	Aggregated	25	GAS	419.249312	0.453925455	0.662366959	37.93877266	3.550007329	1762.920224	0.001676673	0.0200	0.0617	0.001541639	0.005	0.02646	0.083416673	0.033001639	0.018201554	0.181953172	
Sacramento	2040	LHDT1	Aggregated	25	DSL	43069.77382	0.076969432	0.087624582	0.360621154	0.435323311	473.1194717	0.010896719	0.0120	0.0764	0.010425332	0.003	0.03276	0.099336719	0.046185332	0.004515415	0.003575082	
Sacramento	2040	LHDT1	Aggregated	25	GAS	25065.54288	0.006295511	0.009186395	0.178219768	0.074121749	707.5887015	0.001612009	0.0080	0.0764	0.001482183	0.002	0.03276	0.086052009	0.036242183	0.00706403	0.002528282	
Sacramento	2040	LHDT2	Aggregated	25	DSL	20993.88378	0.06455663	0.073493431	0.288616239	0.099260122	533.9418555	0.009527802	0.0120	0.0892	0.009115633	0.003	0.03822	0.110707802	0.050335633	0.005095899	0.002998531	
Sacramento	2040	LHDT2	Aggregated	25	GAS	8597.875976	0.004613889	0.006732576	0.149119053	0.038856568	791.6078833	0.001667691	0.0080	0.0892	0.001533381	0.002	0.03822	0.098847691	0.041753381	0.007901928	0.001852942	
Sacramento	2040	MDV	Aggregated	25	DSL	16110.56425	0.008033168	0.009145227	0.252366784	0.014303388	363.9872728	0.001360871	0.0080	0.0367	0.001302	0.002	0.01575	0.046110871	0.019052	0.003473866	0.000373125	
Sacramento	2040	MDV	Aggregated	25	GAS	577533.9054	0.010875408	0.01586937	0.651778448	0.044993905	394.9170423	0.001263755	0.0080	0.0367	0.001161976	0.002	0.01575	0.046013755	0.018911976	0.002874111	0.004221642	
Sacramento	2040	MH	Aggregated	25	DSL	332.1699093	0.070351296	0.080090273	0.219991168	3.159741532	1097.276205	0.029505264	0.0160	0.1303	0.028228879	0.004	0.05586	0.175845264	0.088088879	0.010472317	0.003267682	
Sacramento	2040	MH	Aggregated	25	GAS	1252.645807	0.015117823	0.022059892	0.265784239	0.130887812	1328.309724	0.001642024	0.0120	0.1303	0.00150978	0.003	0.05586	0.143982024	0.06036978	0.013259869	0.00602118	
Sacramento	2040	MHDT	Aggregated	25	DSL	47577.28382	0.071058699	0.08089492	0.373221088	1.3572989	1266.26933	0.003638634	0.0120	0.1303	0.003481229	0.003	0.05586	0.145978634	0.062341229	0.012080798	0.003300492	
Sacramento	2040	MHDT	Aggregated	25	GAS	4630.952858	0.01480328	0.021600911	0.278024029	0.111892998	1321.925021	0.001660113	0.0120	0.1303	0.001526413	0.003	0.05586	0.144000113	0.060386413	0.013196332	0.005895902	
Sacramento	2040	OBUS	Aggregated	25	DSL	2390.675701	0.110131704	0.125376561	0.621724701	1.90181172	1497.579669	0.004873142	0.0120	0.1303	0.004662332	0.003	0.05586	0.147213142	0.063522332	0.014708318	0.005424405	
Sacramento	2040	OBUS	Aggregated	25	GAS	2482.341144	0.0158444	0.023120111	0.296720149	0.116755599	1322.634545	0.001671088	0.0120	0.1303	0.001536504	0.003	0.05586	0.144011088	0.060396504	0.013203745	0.006310563	
Sacramento	2040	SBUS	Aggregated	25	DSL	2397.463783	0.069271692	0.078860549	0.360261141	1.293976664	1271.045166	0.003554144	0.0120	0.7448	0.003400394	0.003	0.3192	0.760354144	0.325600394	0.012126362	0.00321749	
Sacramento	2040	SBUS	Aggregated	25	GAS	1656.383266	0.012397775	0.018090804	0.224014536	0.098787512	626.808499	0.001639551	0.0080	0.7448	0.001507507	0.002	0.3192	0.754439551	0.322707507	0.0062589	0.004977447	
Sacramento	2040	UBUS	Aggregated	25	DSL	257.3782107	0.060917559	1.005974731	4.120572739	1.297253015	1603.827901	0.005113764	0.0120	0.8418	0.004892545	0.003	0.36078	0.858933764	0.368672545	0.019417407	0.013436759	
Sacramento	2040	UBUS	Aggregated	25	GAS	259.8066948	0.036738933	0.053609365	0.899575651	0.477136937	1333.547684	0.001596766	0.0120	0.1303	0.001468167	0.003	0.05586	0.143936766	0.060328167	0.013322823	0.014610089	
Sacramento	2040	MCY	Aggregated	25	GAS	30625.59327	3.042986794	3.814422765	19.9154688	1.193043351	214.4647063	0.003209025	0.0040	0.0118	0.002992015	0.001	0.00504	0.018969025	0.009032015	0.002563547	0.655384756	
Sacramento	2040	LDA	Aggregated	30	DSL	26761.06674	0.005199403	0.005919175	0.167685485	0.010716514	193.8596854	0.000943991	0.0080	0.0368	0.000903154	0.002	0.01575	0.045693991	0.018653154	0.001850181	0.000241502	
Sacramento	2040	LDA	Aggregated	30	GAS	1932534.428	0.004381259	0.006393122	0.365442546	0.023465869	205.0387572	0.000888005	0.0080	0.0367	0.000816488	0.002	0.01575	0.045638005	0.018566488	0.001987843	0.001697978	
Sacramento	2040	LDT1	Aggregated	30	DSL	81.58948009	0.022518286	0.025635571	0.228006747	0.14577302	227.164158	0.008690984	0.0080	0.0368	0.008315016	0.002	0.01575	0.053440984	0.026065016	0.002168037	0.001045931	
Sacramento	2040	LDT1	Aggregated	30	GAS	134219.791	0.005233637	0.007636911	0.402760087	0.026993949	221.6004633	0.000939408	0.0080	0.0367	0.000863751	0.002	0.01575	0.045689408	0.018613751	0.00215072	0.002030218	
Sacramento	2040	LDT2	Aggregated	30	DSL	1856.277806	0.017019562	0.01937564	0.173325539	0.035459545	242.3853158	0.004911805	0.0080	0.0368	0.004699323	0.002	0.01575	0.049661805	0.022449323	0.002313306	0.000790526	
Sacramento	2040	LDT2	Aggregated	30	GAS	848451.1692	0.005914145	0.008629906	0.489169934	0.029488848	256.7979628	0.000919357	0.0080	0.0368	0.000845314	0.002	0.01575	0.045669357	0.018595314	0.002070725	0.002294279	
Sacramento	2040	HHDT	Aggregated	30	DSL	76792.0188	0.110720535	0.185374324	0.85142006	1.538286368	1659.819678	0.005881126	0.0360	0.0617	0.005626712	0.009	0.02646	0.103621126	0.041086712	0.015464181	0.005226794	
Sacramento	2040	HHDT	Aggregated	30	GAS	765.6278665	0.354255482	0.516928768	34.97383576	3.280312681	1678.48779	0.001306693	0.0200	0.0617	0.001201456	0.005	0.02646	0.083046693	0.032661456	0.017307897	0.141802773	
Sacramento	2040	LHDT1	Aggregated	30	DSL	36356.34572	0.05943241	0.067659847	0.281767432	0.43926761	429.6436284	0.009488929	0.0120	0.0764	0.009078442	0.003	0.03276	0.097928929	0.044838442	0.004100485	0.002760521	
Sacramento	2040	LHDT1	Aggregated	30	GAS	22166.16613	0.004907162	0.00716052	0.16409085	0.068580522	642.1813426	0.001256298	0.0080	0.0764	0.001155119	0.002	0.03276	0.085696298	0.035915119	0.006411055	0.001970383	
Sacramento	2040	LHDT2	Aggregated	30	DSL	17721.49768	0.048873487	0.055639216	0.218832052	0.089030192	481.530385	0.008427786	0.0120	0.0892	0.008063204	0.003	0.03822	0.109607786	0.049283204	0.004595688	0.002270079	
Sacramento	2040	LHDT2	Aggregated	30	GAS	7603.34409	0.003596389	0.005247842	0.137297183	0.035951712	715.4917407	0.001299693	0.0080	0.0892	0.00119502	0.002	0.03822	0.098479693	0.04141502	0.007142141	0.001444065	
Sacramento	2040	MDV	Aggregated	30	DSL	11251.66547	0.006070267	0.006910595	0.190660582	0.01197495	314.371651	0.00120492	0.0080	0.0367	0.001152795	0.002	0.01575	0.04595492	0.018902795	0.003000338	0.000281952	
Sacramento	2040	MDV	Aggregated	30	GAS	403351.3785	0.008497086	0.012398928	0.600335775	0.041651667	340.0245484	0.000985096	0.0080	0.0367	0.000905759	0.002	0.01575	0.045735096	0.018655759	0.00247438	0.003297013	
Sacramento	2040	MH	Aggregated	30	DSL	399.4074048	0.0538843	0.061343693	0.172263977	2.673214514	1029.959641	0.026389766	0.0160	0.1303	0.025248156	0.004	0.05586	0.172729766	0.085108156	0.009829853	0.002502822	
Sacramento	2040	MH	Aggregated	30	GAS	1416.294518	0.011757668	0.017156762	0.244185141	0.121640239	1220.66248	0.001279689	0.0120	0.1303	0.001176627	0.003	0.05586	0.143619689	0.060036627	0.012185197	0.004692526	
Sacramento	2040	MHDT	Aggregated	30	DSL	57207.82927	0.052373408	0.059623138	0.27507817	0.842078425	1198.592029	0.003347511	0.0120	0.1303	0.003202699	0.003	0.05586	0.145687511	0.062062699	0.011435125	0.002432608	
Sacramento	2040	MHDT	Aggregated	30	GAS	5235.951863	0.011513037	0.016799796	0.255430258	0.10398746	1214.795199	0.001293787	0.0120	0.1303	0.001189589	0.003	0.05586	0.143633787	0.060049589	0.012126811	0.004594893	
Sacramento	2040	OBUS	Aggregated	30	DSL	2976.994363	0.082345618	0.093744218	0.46589663	1.183884374	1428.08447	0.00452779	0.0120	0.1303	0.004331919	0.003	0.05586	0.14686779	0.063191919	0.013926558	0.003997396	
Sacramento	2040	OBUS	Aggregated	30	GAS	2806.640261	0.012322753	0.017981332	0.272607028	0.108506505	1215.447222	0.00130234	0.0120	0.1303	0.001197454	0.003	0.05586	0.14364234	0.060057454	0.012133618	0.004918053	
Sacramento	2040	SBUS	Aggregated	30	DSL	2876.326214	0.051051627	0.058118391	0.265500544	0.80713209	1203.379118	0.003272709	0.0120	0.7448	0.003131133	0.003	0.3192	0.760072709	0.325331133	0.011480796	0.002371215	
Sacramento	2040	SBUS	Aggregated	30	GAS	1987.224433	0.009658534	0.014093711	0.206153191	0.091573391	576.0114554	0.001277762	0.0080	0.7448	0.001174855	0.002	0.3192	0.754077762	0.322374855	0.005751607	0.003879107	
Sacramento	2040	UBUS	Aggregated	30	DSL	269.0284144	0.048205197	0.773581051	3.20106979	1.220882396	1505.435005	0.004254753	0.0120	0.8418	0.004070694	0.003	0.36078	0.858074753	0.367850694	0.018226172	0.010600957	
Sacramento	2040	UBUS	Aggregated	30	GAS	271.5668237	0.028570482	0.041689981	0.826398287	0.443523323	1225.475952	0.001244418	0.0120	0.1303	0.001144196	0.003	0.05586	0.143584418	0.060004196	0.012242938	0.011386178	
Sacramento	2040	MCY	Aggregated	30	GAS	21389.00443	2.431543243	3.047620726	17.85677734	1.143410701	184.5974503	0.002550244	0.0040	0.0118	0.002377812	0.001	0.00504	0.018310244	0.008417812	0.002210461	0.523312954	
Sacramento	2040	LDA	Aggregated	35	DSL	47567.89408	0.004137992	0.004710829	0.133391467	0.009404704	175.2452507	0.000852666	0.0080	0.0368	0.00081578	0.002	0.01575	0.045602666	0.01856578	0.001672527	0.000192202	
Sacramento	2040	LDA	Aggregated	35	GAS	3435087.019	0.0035993	0.00525209	0.336743249	0.022060915	183.0657653	0.000730092	0.0080	0.0367	0.000671293	0.002	0.01575	0.045480092	0.018421293	0.001775993	0.001396075	
Sacramento	2040	LDT1	Aggregated	35	DSL	145.0255995	0.018434593	0.020986558	0.189627944	0.146450119	205.0243831	0.007731674	0.0080	0.0368	0.007397205	0.002	0.01575	0.052481674	0.025147205	0.001956736	0.000856251	
Sacramento	2040	LDT1	Aggregated	35	GAS	238576.1698	0.004302403	0.006278056	0.371091371	0.025375723	197.8562577	0.000772405	0.0080	0.0367	0.000710197	0.002	0.01575	0.045522405	0.018460197	0.001921514	0.001670323	
Sacramento	2040	LDT2	Aggregated	35	DSL	3299.540595	0.013534714	0.015408372	0.137846942	0.030708503	218.7620631	0.004440876	0.0080	0.0368	0.004248765	0.002	0.01575	0.049190876	0.021998765	0.002087848	0.000628661	
Sacramento	2040	LDT2	Aggregated	35	GAS	1508125.059	0.004859619	0.007091145	0.450751703	0.027722484	229.2826738	0.000755882	0.0080	0.0368	0.000695005	0.002	0.01575	0.045505882	0.018445005	0.001850085	0.001886717	
Sacramento	2040	HHDT	Aggregated	35	DSL	140612.0458	0.080696307	0.151049071	0.674160402	1.060982021	1611.145702	0.005448504	0.0360	0.0617	0.005212805	0.009	0.02646	0.103188504	0.040672805	0.014758316	0.003854284	
Sacramento	2040	HHDT	Aggregated	35	GAS	1361.77186	0.291638489	0.425558198	32.32531546	3.08147502	1609.803648	0.001074321	0.0200	0.0617	0.000987799	0.005	0.02646	0.082814321	0.032447799	0.016578043	0.116585744	
Sacramento	2040	LHDT1	Aggregated	35	DSL	19186.65503	0.048322117	0.055011517	0.232685269	0.449815492	429.6436284	0.008496984	0.0120	0.0764	0.008129408	0.003	0.03276	0.096936984	0.043889408	0.004100485	0.002244469	
Sacramento	2040	LHDT1	Aggregated	35	GAS	8282.691093	0.003995022	0.005829526	0.15002958	0.065806796	642.1813426	0.001032888	0.0080	0.0764	0.000949703	0.002	0.03276	0.085472888	0.035709703	0.006410821	0.001619986	
Sacramento	2040	LHDT2	Aggregated	35	DSL	9352.322291	0.038951466	0.044343654	0.17475924	0.083074783	481.530385	0.007613254	0.0120	0.0892	0.007283908	0.003	0.03822	0.108793254	0.048503908	0.004595688	0.001809221	
Sacramento	2040	LHDT2	Aggregated	35	GAS	2841.093493	0.002927894	0.004272376	0.125531915	0.034497652	715.4917407	0.001068566	0.0080	0.0892	0.000982507	0.002	0.03822	0.098248566	0.041202507	0.00714195	0.001187265	
Sacramento	2040	MDV	Aggregated	35	DSL	19999.87655	0.004828578	0.005497014	0.151630325	0.010419607	285.2488003	0.001089049	0.0080	0.0367	0.001041937	0.002	0.01575	0.045839049	0.018791937	0.002722392	0.000224278	
Sacramento	2040	MDV	Aggregated	35	GAS	716958.5516	0.006989388	0.010198899	0.553067393	0.039143958	303.5923586	0.000810017	0.0080	0.0367	0.000744781	0.002	0.01575	0.045560017	0.018494781	0.002210731	0.002714174	
Sacramento	2040	MH	Aggregated	35	DSL	470.9539344	0.043152609	0.049126376	0.140888583	2.346091889	974.0952389	0.024351727	0.0160	0.1303	0.023298282	0.004	0.05586	0.170691727	0.083158282	0.009296688	0.002004356	
Sacramento	2040	MH	Aggregated	35	GAS	1760.239211	0.00965285	0.014085416	0.225089899	0.114859529	1126.967458	0.00105212	0.0120	0.1303	0.000967385	0.003	0.05586	0.14339212	0.059827385	0.01124984	0.003858046	
Sacramento	2040	MHDT	Aggregated	35	DSL	67455.56529	0.038602797	0.043946346	0.202750913	0.568667794	1144.838693	0.003106746	0.0120	0.1303	0.002972349	0.003	0.05586	0.145446746	0.061832349	0.010922293	0.001792999	
Sacramento	2040	MHDT	Aggregated	35	GAS	6507.493787	0.009452011	0.013792353	0.235455649	0.098190786	1121.550534	0.001063711	0.0120	0.1303	0.000978043	0.003	0.05586	0.143403711	0.059838043	0.011195938	0.003777775	
Sacramento	2040	OBUS	Aggregated	35	DSL	3599.583161	0.061291813	0.069776064	0.347300229	0.798296307	1371.332737	0.004229773	0.0120	0.1303	0.004046794	0.003	0.05586	0.146569773	0.062906794	0.013307548	0.002945793	
Sacramento	2040	OBUS	Aggregated	35	GAS	3488.228032	0.010116775	0.014762374	0.251289198	0.102457922	1122.15251	0.001070743	0.0120	0.1303	0.000984508	0.003	0.05586	0.143410743	0.059844508	0.011202218	0.004043467	
Sacramento	2040	SBUS	Aggregated	35	DSL	2952.187005	0.037624322	0.042832427	0.195669236	0.548524848	1149.80587	0.003038547	0.0120	0.7448	0.002907101	0.003	0.3192	0.759838547	0.325107101	0.010969682	0.001747552	
Sacramento	2040	SBUS	Aggregated	35	GAS	2039.63588	0.007922995	0.011561215	0.189877881	0.086556531	531.7982456	0.001050536	0.0080	0.7448	0.000965929	0.002	0.3192	0.753850536	0.322165929	0.005310086	0.003189278	
Sacramento	2040	UBUS	Aggregated	35	DSL	347.6713284	0.038789439	0.618156082	2.595078369	1.17038502	1423.7811	0.003657188	0.0120	0.8418	0.00349898	0.003	0.36078	0.857477188	0.36727898	0.017237596	0.008455512	
Sacramento	2040	UBUS	Aggregated	35	GAS	350.9517704	0.023439033	0.034202181	0.761243964	0.419457521	1131.41146	0.001023121	0.0120	0.1303	0.000940722	0.003	0.05586	0.143363121	0.059800722	0.011303077	0.009361354	

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2040	MCY	Aggregated	35	GAS	38019.03367	2.04391786	2.561529475	16.43075118	1.109923277	164.9109474	0.002134895	0.0040	0.0118	0.001990567	0.001	0.00504	0.017894895	0.008030567	0.001977878	0.439958405	
Sacramento	2040	LDA	Aggregated	40	DSL	58282.51073	0.003414795	0.003887518	0.110019964	0.008477836	163.9903403	0.000782122	0.0080	0.0368	0.000748288	0.002	0.01575	0.045532122	0.018498288	0.001565111	0.000158611	
Sacramento	2040	LDA	Aggregated	40	GAS	4208836.651	0.003114169	0.004544188	0.310504029	0.021116188	169.4626592	0.000633248	0.0080	0.0367	0.000582248	0.002	0.01575	0.045383248	0.018332248	0.00164671	0.001210902	
Sacramento	2040	LDT1	Aggregated	40	DSL	177.6924588	0.015725739	0.017902708	0.165187365	0.148476443	191.3534655	0.007081022	0.0080	0.0368	0.0067747	0.002	0.01575	0.051831022	0.0245247	0.001826262	0.00073043	
Sacramento	2040	LDT1	Aggregated	40	GAS	292315.1938	0.003723399	0.005433176	0.342195659	0.024294508	183.1635926	0.000669961	0.0080	0.0367	0.000616004	0.002	0.01575	0.045419961	0.018366004	0.001781636	0.001449056	
Sacramento	2040	LDT2	Aggregated	40	DSL	4042.758542	0.011158797	0.012703549	0.113661679	0.027317322	204.1751242	0.004073866	0.0080	0.0368	0.003897632	0.002	0.01575	0.048823866	0.021647632	0.001948631	0.000518305	
Sacramento	2040	LDT2	Aggregated	40	GAS	1847828.596	0.004205053	0.006136004	0.415663777	0.026538579	212.2570478	0.00065562	0.0080	0.0368	0.000602818	0.002	0.01575	0.04540562	0.018352818	0.001715404	0.001636561	
Sacramento	2040	HHDT	Aggregated	40	DSL	130671.1565	0.060167257	0.102401348	0.467409789	0.788320132	1522.494171	0.005103839	0.0360	0.0617	0.004883049	0.009	0.02646	0.102843839	0.040343049	0.01415069	0.002842935	
Sacramento	2040	HHDT	Aggregated	40	GAS	1187.088887	0.252822646	0.368918211	29.90412907	2.94932987	1551.55844	0.000931815	0.0200	0.0617	0.00085677	0.005	0.02646	0.082671815	0.03231677	0.015957856	0.101120942	
Sacramento	2040	LHDT1	Aggregated	40	DSL	10532.84646	0.040898655	0.046560399	0.201010874	0.462546225	417.8816023	0.007787149	0.0120	0.0764	0.00745028	0.003	0.03276	0.096227149	0.04321028	0.003988229	0.001899664	
Sacramento	2040	LHDT1	Aggregated	40	GAS	2444.861535	0.0034285	0.005002859	0.137451131	0.064441797	639.7678333	0.000895878	0.0080	0.0764	0.000823727	0.002	0.03276	0.085335878	0.035583727	0.006386538	0.001405099	
Sacramento	2040	LHDT2	Aggregated	40	DSL	5134.119239	0.032198948	0.036656361	0.144865046	0.079220931	463.9426069	0.006983466	0.0120	0.0892	0.006681364	0.003	0.03822	0.108163466	0.047901364	0.004427831	0.001495579	
Sacramento	2040	LHDT2	Aggregated	40	GAS	838.6260119	0.002512698	0.003666523	0.115007346	0.033782083	699.1482251	0.000926824	0.0080	0.0892	0.00085218	0.002	0.03822	0.098106824	0.04107218	0.006978695	0.001029777	
Sacramento	2040	MDV	Aggregated	40	DSL	24504.82709	0.003982189	0.004533457	0.125023262	0.009313191	266.8110165	0.000999014	0.0080	0.0367	0.000955797	0.002	0.01575	0.045749014	0.018705797	0.002546423	0.000184965	
Sacramento	2040	MDV	Aggregated	40	GAS	878452.6892	0.00604995	0.008828073	0.509995618	0.037497823	281.0504355	0.000702597	0.0080	0.0367	0.000646012	0.002	0.01575	0.045452597	0.018396012	0.002049792	0.00235505	
Sacramento	2040	MH	Aggregated	40	DSL	584.615995	0.035753614	0.040703112	0.119083209	2.11188996	929.6829984	0.023203539	0.0160	0.1303	0.022199765	0.004	0.05586	0.169543539	0.082059765	0.008872821	0.001660687	
Sacramento	2040	MH	Aggregated	40	GAS	2191.316373	0.008364479	0.012205428	0.208152052	0.11017634	1048.477018	0.000912559	0.0120	0.1303	0.000839064	0.003	0.05586	0.143252559	0.059699064	0.010466275	0.003346286	
Sacramento	2040	MHDT	Aggregated	40	DSL	83735.58334	0.028455112	0.032393979	0.149450097	0.408012511	1099.914932	0.002902658	0.0120	0.1303	0.00277709	0.003	0.05586	0.145242658	0.06163709	0.0104937	0.001321666	
Sacramento	2040	MHDT	Aggregated	40	GAS	8101.158974	0.008190447	0.01195148	0.217737788	0.094187234	1043.43737	0.000922612	0.0120	0.1303	0.000848308	0.003	0.05586	0.143262612	0.059708308	0.010416126	0.003276663	
Sacramento	2040	OBUS	Aggregated	40	DSL	4896.502653	0.046710111	0.053175906	0.265984847	0.579223775	1341.176633	0.00403489	0.0120	0.1303	0.003860342	0.003	0.05586	0.14637489	0.062720342	0.012799221	0.002170838	
Sacramento	2040	OBUS	Aggregated	40	GAS	4342.484334	0.008766484	0.012792033	0.232379874	0.098280385	1043.997419	0.000928711	0.0120	0.1303	0.000853916	0.003	0.05586	0.143268711	0.059713916	0.010421967	0.003507112	
Sacramento	2040	SBUS	Aggregated	40	DSL	1992.882299	0.027729046	0.031567408	0.144209316	0.396318861	1105.816096	0.002838107	0.0120	0.7448	0.002715332	0.003	0.3192	0.759638107	0.324915332	0.010549999	0.001287942	
Sacramento	2040	SBUS	Aggregated	40	GAS	1376.862046	0.006861529	0.010012328	0.175485616	0.083021001	494.7598397	0.000911185	0.0080	0.7448	0.000837801	0.002	0.3192	0.753711185	0.322037801	0.004940216	0.002766229	
Sacramento	2040	UBUS	Aggregated	40	DSL	463.1989313	0.032272817	0.511516713	2.171827458	1.136767455	1358.866186	0.003311262	0.0120	0.8418	0.003168018	0.003	0.36078	0.857131262	0.366948018	0.016451676	0.006994755	
Sacramento	2040	UBUS	Aggregated	40	GAS	467.5694305	0.020314989	0.029643584	0.704104005	0.402141531	1052.611506	0.000887407	0.0120	0.1303	0.000815938	0.003	0.05586	0.143227407	0.059675938	0.010515728	0.008119595	
Sacramento	2040	MCY	Aggregated	40	GAS	46582.77984	1.809966033	2.268119844	15.57659764	1.093041473	152.9078534	0.001882053	0.0040	0.0118	0.001754835	0.001	0.00504	0.017642053	0.007794835	0.001836071	0.389317442	
Sacramento	2040	LDA	Aggregated	45	DSL	22583.57913	0.00289511	0.00329589	0.093213623	0.007790658	158.4020708	0.000725982	0.0080	0.0368	0.000694576	0.002	0.01575	0.045475982	0.018444576	0.001511777	0.000134472	
Sacramento	2040	LDA	Aggregated	45	GAS	1630859.659	0.002849768	0.004158375	0.288312854	0.020542391	163.0984567	0.000579433	0.0080	0.0367	0.000532767	0.002	0.01575	0.045329433	0.018282767	0.001584559	0.001107982	
Sacramento	2040	LDT1	Aggregated	45	DSL	68.85310283	0.013906242	0.015831332	0.150177778	0.151337582	184.4972037	0.006663027	0.0080	0.0368	0.006374787	0.002	0.01575	0.051413027	0.024124787	0.001760827	0.000645918	
Sacramento	2040	LDT1	Aggregated	45	GAS	113267.6549	0.003406343	0.004970528	0.317757779	0.023645535	176.2843335	0.000613009	0.0080	0.0367	0.000563639	0.002	0.01575	0.045363009	0.018313639	0.001714389	0.001325535	
Sacramento	2040	LDT2	Aggregated	45	DSL	1566.506938	0.009448885	0.010756927	0.096260496	0.024772996	196.8594579	0.003778203	0.0080	0.0368	0.00361476	0.002	0.01575	0.048528203	0.02136476	0.001878811	0.000438883	
Sacramento	2040	LDT2	Aggregated	45	GAS	716005.244	0.003847712	0.005614573	0.385961649	0.025822895	204.2850563	0.000599899	0.0080	0.0368	0.000551585	0.002	0.01575	0.045349899	0.018301585	0.001650612	0.001497341	
Sacramento	2040	HHDT	Aggregated	45	DSL	179141.7785	0.045051034	0.066221484	0.314288014	0.613370662	1440.366559	0.004819589	0.0360	0.0617	0.004611096	0.009	0.02646	0.102559589	0.040071096	0.013670521	0.002098134	
Sacramento	2040	HHDT	Aggregated	45	GAS	1256.066799	0.2306449	0.336556497	27.67337817	2.885451843	1517.434726	0.000852629	0.0200	0.0617	0.000783961	0.005	0.02646	0.082592629	0.032243961	0.01558304	0.092527582	
Sacramento	2040	LHDT1	Aggregated	45	DSL	11368.40534	0.035817313	0.04077563	0.180890096	0.474697109	407.6106218	0.007284523	0.0120	0.0764	0.006969398	0.003	0.03276	0.095724523	0.042729398	0.003890203	0.001663645	
Sacramento	2040	LHDT1	Aggregated	45	GAS	3009.839704	0.003159833	0.004610821	0.128455751	0.061713424	636.8298314	0.000819746	0.0080	0.0764	0.000753726	0.002	0.03276	0.085259746	0.035513726	0.00635705	0.001285693	
Sacramento	2040	LHDT2	Aggregated	45	DSL	5541.403155	0.027360252	0.031147828	0.123580118	0.076376182	445.9627997	0.006481584	0.0120	0.0892	0.006201193	0.003	0.03822	0.107661584	0.047421193	0.004256234	0.001270831	
Sacramento	2040	LHDT2	Aggregated	45	GAS	1032.422422	0.002315796	0.003379204	0.107480781	0.032351798	682.6710186	0.000848061	0.0080	0.0892	0.000779761	0.002	0.03822	0.098028061	0.040999761	0.006814129	0.000942266	
Sacramento	2040	MDV	Aggregated	45	DSL	9495.24471	0.003373359	0.003840345	0.105878583	0.008486331	256.7670747	0.000926774	0.0080	0.0367	0.000886682	0.002	0.01575	0.045676774	0.018636682	0.002450565	0.000156686	
Sacramento	2040	MDV	Aggregated	45	GAS	340386.9458	0.005533398	0.008074321	0.473600485	0.036548542	270.494599	0.000642856	0.0080	0.0367	0.000591082	0.002	0.01575	0.045392856	0.018341082	0.001972362	0.002153763	
Sacramento	2040	MH	Aggregated	45	DSL	478.7229808	0.030524705	0.034750347	0.103566184	1.933757491	896.7229196	0.022839255	0.0160	0.1303	0.021851239	0.004	0.05586	0.169179255	0.081711239	0.008558252	0.001417814	
Sacramento	2040	MH	Aggregated	45	GAS	1998.330785	0.007667412	0.011188269	0.193515727	0.106637903	974.1932092	0.000835009	0.0120	0.1303	0.00076776	0.003	0.05586	0.143175009	0.05962776	0.009724739	0.003061915	
Sacramento	2040	MHDT	Aggregated	45	DSL	68568.33955	0.020978411	0.023882325	0.110172568	0.305873769	1062.915146	0.002726737	0.0120	0.1303	0.002608779	0.003	0.05586	0.145066737	0.061468779	0.010140704	0.000974393	
Sacramento	2040	MHDT	Aggregated	45	GAS	7387.703378	0.007507882	0.010955485	0.202427436	0.091162306	969.5106162	0.000844208	0.0120	0.1303	0.000776218	0.003	0.05586	0.143184208	0.059636218	0.009678143	0.002998209	
Sacramento	2040	OBUS	Aggregated	45	DSL	3572.801682	0.03297184	0.03753593	0.186563514	0.418394311	1268.852298	0.003683581	0.0120	0.1303	0.003524231	0.003	0.05586	0.146023581	0.062384231	0.012370558	0.001599751	
Sacramento	2040	OBUS	Aggregated	45	GAS	3960.048961	0.008035915	0.011725988	0.216039956	0.095124001	970.0309863	0.000849789	0.0120	0.1303	0.000781349	0.003	0.05586	0.143189789	0.059641349	0.009683569	0.003209074	
Sacramento	2040	SBUS	Aggregated	45	DSL	956.1369555	0.02043673	0.023265661	0.106288085	0.299911565	1068.723521	0.002662953	0.0120	0.7448	0.002547755	0.003	0.3192	0.759462953	0.324747755	0.010196119	0.000949233	
Sacramento	2040	SBUS	Aggregated	45	GAS	660.5852667	0.006273601	0.009154424	0.162743081	0.08080176	459.7064768	0.000833751	0.0080	0.7448	0.000766604	0.002	0.3192	0.753633751	0.321966604	0.004590199	0.002531152	
Sacramento	2040	UBUS	Aggregated	45	DSL	387.8880966	0.028462979	0.440025134	1.868037239	1.114669478	1310.690263	0.003211435	0.0120	0.8418	0.003072509	0.003	0.36078	0.857031435	0.366852509	0.015868414	0.00621594	
Sacramento	2040	UBUS	Aggregated	45	GAS	391.5480027	0.018623747	0.027175728	0.654659625	0.389244857	978.034772	0.000811994	0.0120	0.1303	0.000746598	0.003	0.05586	0.143151994	0.059606598	0.009770673	0.007429583	
Sacramento	2040	MCY	Aggregated	45	GAS	18050.11283	1.686454348	2.113178356	15.22876812	1.088240334	147.1517283	0.001746765	0.0040	0.0118	0.001628704	0.001	0.00504	0.017506765	0.007668704	0.001768396	0.362502346	
Sacramento	2040	LDA	Aggregated	50	DSL	22639.43974	0.00250661	0.002853609	0.080633793	0.007259971	158.805296	0.000680397	0.0080	0.0368	0.000650963	0.002	0.01575	0.045430397	0.018400963	0.001515625	0.000116427	
Sacramento	2040	LDA	Aggregated	50	GAS	1634893.599	0.00276116	0.004029078	0.269683507	0.020223847	163.3088925	0.000559328	0.0080	0.0367	0.000514282	0.002	0.01575	0.045309328	0.018264282	0.001582412	0.001069498	
Sacramento	2040	LDT1	Aggregated	50	DSL	69.02341134	0.012722365	0.014483566	0.142535399	0.154686291	184.8036953	0.006438961	0.0080	0.0368	0.006160414	0.002	0.01575	0.051188961	0.023910414	0.001763752	0.000590929	
Sacramento	2040	LDT1	Aggregated	50	GAS	113547.823	0.003297831	0.004812188	0.297232865	0.023295796	176.4981004	0.000591697	0.0080	0.0367	0.000544043	0.002	0.01575	0.045341697	0.018294043	0.00171206	0.001278576	
Sacramento	2040	LDT2	Aggregated	50	DSL	1570.381701	0.008167018	0.009297607	0.083221871	0.022782844	197.1864859	0.003533987	0.0080	0.0368	0.003381109	0.002	0.01575	0.048283987	0.021131109	0.001881932	0.000379342	
Sacramento	2040	LDT2	Aggregated	50	GAS	717776.2868	0.003727022	0.005438462	0.360988738	0.025429866	204.5317063	0.000579073	0.0080	0.0368	0.000532437	0.002	0.01575	0.045329073	0.018282437	0.001648288	0.001445024	
Sacramento	2040	HHDT	Aggregated	50	DSL	182627.261	0.033736675	0.042187087	0.210226623	0.491510088	1365.491013	0.00458401	0.0360	0.0617	0.004385708	0.009	0.02646	0.10232401	0.039845708	0.013231706	0.001550139	
Sacramento	2040	HHDT	Aggregated	50	GAS	1314.201583	0.222720878	0.324993782	25.76062276	2.846151656	1498.590281	0.000823048	0.0200	0.0617	0.000756762	0.005	0.02646	0.082563048	0.032216762	0.015364747	0.089317481	
Sacramento	2040	LHDT1	Aggregated	50	DSL	43897.01526	0.032369889	0.036850967	0.169548792	0.488014485	427.3252543	0.006948371	0.0120	0.0764	0.006647788	0.003	0.03276	0.095388371	0.042407788	0.004078358	0.001503519	
Sacramento	2040	LHDT1	Aggregated	50	GAS	22224.2369	0.003101512	0.004525719	0.121497965	0.059074051	671.5842444	0.000791306	0.0080	0.0764	0.000727576	0.002	0.03276	0.085231306	0.035487576	0.006703717	0.001241088	
Sacramento	2040	LHDT2	Aggregated	50	DSL	21397.11345	0.023761918	0.027051364	0.107944645	0.074489011	462.3883603	0.006073282	0.0120	0.0892	0.005810555	0.003	0.03822	0.107253282	0.047030555	0.004412998	0.001103695	
Sacramento	2040	LHDT2	Aggregated	50	GAS	7623.263276	0.002273054	0.003316835	0.101659102	0.03096817	711.707774	0.000818639	0.0080	0.0892	0.000752708	0.002	0.03822	0.097998639	0.040972708	0.007103764	0.000909575	
Sacramento	2040	MDV	Aggregated	50	DSL	9518.731249	0.002917359	0.00332122	0.091532136	0.007842267	258.0537275	0.000867437	0.0080	0.0367	0.000829912	0.002	0.01575	0.045617437	0.018579912	0.002462844	0.000135506	
Sacramento	2040	MDV	Aggregated	50	GAS	341228.8947	0.005353457	0.007811751	0.443060969	0.036092639	270.8188131	0.000620465	0.0080	0.0367	0.000570495	0.002	0.01575	0.045370465	0.018320495	0.001969573	0.002076085	
Sacramento	2040	MH	Aggregated	50	DSL	535.7688667	0.026841209	0.030556931	0.092574262	1.80180767	875.2150026	0.023194053	0.0160	0.1303	0.022190688	0.004	0.05586	0.169534053	0.082050688	0.008352983	0.001246722	
Sacramento	2040	MH	Aggregated	50	GAS	1944.786543	0.007358343	0.010737276	0.179063412	0.106464272	911.3122705	0.000806039	0.0120	0.1303	0.000741123	0.003	0.05586	0.143146039	0.059601123	0.009097034	0.002955687	
Sacramento	2040	MHDT	Aggregated	50	DSL	76739.12272	0.01547117	0.01761275	0.081231378	0.238303966	1030.34785	0.00257333	0.0120	0.1303	0.002462009	0.003	0.05586	0.14491333	0.061322009	0.009829997	0.000718596	
Sacramento	2040	MHDT	Aggregated	50	GAS	7189.753679	0.007205244	0.010513875	0.187309569	0.091013873	906.9319234	0.000814919	0.0120	0.1303	0.000749288	0.003	0.05586	0.143154919	0.059609288	0.009053445	0.00289419	
Sacramento	2040	OBUS	Aggregated	50	DSL	4758.455836	0.025864505	0.02944477	0.147690969	0.333211203	1269.996907	0.003607512	0.0120	0.1303	0.003451452	0.003	0.05586	0.145947512	0.062311452	0.012001691	0.001178902	
Sacramento	2040	OBUS	Aggregated	50	GAS	3853.941494	0.007711991	0.01125332	0.199905466	0.094969117	907.4187054	0.000820306	0.0120	0.1303	0.000754242	0.003	0.05586	0.143160306	0.059614242	0.009058521	0.00309774	
Sacramento	2040	SBUS	Aggregated	50	DSL	478.8624305	0.015062716	0.017147756	0.078344189	0.235201302	1036.807872	0.002507476	0.0120	0.7448	0.002399003	0.003	0.3192	0.759307476	0.324599003	0.009891629	0.000699624	

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2040	SBUS	Aggregated	50	GAS	330.8411672	0.006072577	0.008861089	0.151851883	0.079400174	430.0339494	0.000804826	0.0080	0.7448	0.000740007	0.002	0.3192	0.753604826	0.321940007	0.004293912	0.002443337	
Sacramento	2040	UBUS	Aggregated	50	DSL	365.0481076	0.027256565	0.396353666	1.649707208	1.105999293	1279.253331	0.003354317	0.0120	0.8418	0.003209211	0.003	0.36078	0.857174317	0.366989211	0.01548781	0.00611759	
Sacramento	2040	UBUS	Aggregated	50	GAS	368.4925077	0.017843255	0.026036836	0.60478607	0.389850785	914.9058733	0.000783823	0.0120	0.1303	0.000720696	0.003	0.05586	0.143123823	0.059580696	0.009139982	0.007171825	
Sacramento	2040	MCY	Aggregated	50	GAS	18094.75988	1.649620503	2.066917036	15.34060515	1.09106534	146.9794147	0.001706418	0.0040	0.0118	0.001591095	0.001	0.00504	0.017466418	0.007631095	0.001767784	0.355077426	
Sacramento	2040	LDA	Aggregated	55	DSL	41200.00841	0.002207424	0.002513005	0.070926419	0.006841634	166.1772373	0.000642965	0.0080	0.0368	0.000615151	0.002	0.01575	0.045392965	0.018365151	0.001585982	0.000102531	
Sacramento	2040	LDA	Aggregated	55	GAS	2975233.964	0.002812515	0.004104016	0.251480774	0.020219694	169.322559	0.000569593	0.0080	0.0367	0.000523719	0.002	0.01575	0.045319593	0.018273719	0.001640059	0.001089062	
Sacramento	2040	LDT1	Aggregated	55	DSL	125.6111088	0.012046675	0.013714339	0.14169386	0.158424677	193.2273184	0.006397285	0.0080	0.0368	0.006120542	0.002	0.01575	0.051147285	0.023870542	0.001844146	0.000559545	
Sacramento	2040	LDT1	Aggregated	55	GAS	206638.1199	0.003355385	0.00489617	0.277244733	0.023317401	182.9966853	0.000602487	0.0080	0.0367	0.000553964	0.002	0.01575	0.045352487	0.018303964	0.001774421	0.001300498	
Sacramento	2040	LDT2	Aggregated	55	DSL	2857.833058	0.007175032	0.008168297	0.073141404	0.021189677	206.1745348	0.003328341	0.0080	0.0368	0.003184358	0.002	0.01575	0.048078341	0.020934358	0.001967713	0.000333266	
Sacramento	2040	LDT2	Aggregated	55	GAS	1306233.255	0.00379506	0.005537743	0.336646788	0.025437459	212.0624171	0.000589682	0.0080	0.0368	0.000542191	0.002	0.01575	0.045339682	0.018292191	0.001708212	0.001470963	
Sacramento	2040	HHDT	Aggregated	55	DSL	220447.886	0.025143936	0.028624457	0.147028813	0.405482567	1310.448052	0.004389519	0.0360	0.0617	0.00419963	0.009	0.02646	0.102129519	0.03965963	0.012840363	0.001147532	
Sacramento	2040	HHDT	Aggregated	55	GAS	1929.150564	0.2275653	0.332062751	24.11554544	2.838441057	1470.373286	0.000838157	0.0200	0.0617	0.000770654	0.005	0.02646	0.082578157	0.032230654	0.015056521	0.090957072	
Sacramento	2040	LHDT1	Aggregated	55	DSL	26435.18139	0.030185151	0.034363788	0.166031504	0.504939985	446.5397261	0.006761147	0.0120	0.0764	0.006468663	0.003	0.03276	0.095201147	0.042228663	0.00426174	0.001402042	
Sacramento	2040	LHDT1	Aggregated	55	GAS	6112.714654	0.003083203	0.004499002	0.110746544	0.062099107	707.5887015	0.000805832	0.0080	0.0764	0.000740932	0.002	0.03276	0.085245832	0.035500932	0.00706288	0.00126387	
Sacramento	2040	LHDT2	Aggregated	55	DSL	12885.53611	0.021016136	0.023925474	0.096296834	0.073678662	478.5942241	0.005737045	0.0120	0.0892	0.005488863	0.003	0.03822	0.106917045	0.046708863	0.004567665	0.000976159	
Sacramento	2040	LHDT2	Aggregated	55	GAS	2096.757398	0.002259635	0.003297254	0.092663232	0.032553983	744.1114103	0.000833667	0.0080	0.0892	0.000766526	0.002	0.03822	0.098013667	0.040986526	0.007427014	0.000926272	
Sacramento	2040	MDV	Aggregated	55	DSL	17322.50498	0.002565041	0.002920129	0.080438549	0.007329249	272.3368306	0.000817876	0.0080	0.0367	0.000782495	0.002	0.01575	0.045567876	0.018532495	0.002599161	0.000119141	
Sacramento	2040	MDV	Aggregated	55	GAS	620979.7369	0.005441212	0.007939804	0.413366995	0.036249861	280.7900357	0.000631716	0.0080	0.0367	0.00058084	0.002	0.01575	0.045381716	0.01833084	0.002041161	0.002109484	
Sacramento	2040	MH	Aggregated	55	DSL	785.1207234	0.024340239	0.027709743	0.085083132	1.700413847	865.1592474	0.024225824	0.0160	0.1303	0.023177825	0.004	0.05586	0.170565824	0.083037825	0.008257011	0.001130557	
Sacramento	2040	MH	Aggregated	55	GAS	2543.60366	0.007472112	0.010903289	0.166625932	0.107543962	886.1939431	0.000820836	0.0120	0.1303	0.000754728	0.003	0.05586	0.143160836	0.059614728	0.008846199	0.003009944	
Sacramento	2040	MHDT	Aggregated	55	DSL	112454.2303	0.011416398	0.0129967	0.059909532	0.191258872	1001.639216	0.002438496	0.0120	0.1303	0.002333007	0.003	0.05586	0.144778496	0.061193007	0.009556104	0.000530262	
Sacramento	2040	MHDT	Aggregated	55	GAS	9403.542942	0.007316646	0.010676433	0.174299323	0.091936875	881.9343306	0.000829878	0.0120	0.1303	0.000763043	0.003	0.05586	0.143169878	0.059623043	0.008803806	0.002947319	
Sacramento	2040	OBUS	Aggregated	55	DSL	7938.411214	0.019798986	0.022539639	0.11365052	0.26843937	1260.140978	0.00348979	0.0120	0.1303	0.003338823	0.003	0.05586	0.14582979	0.062198823	0.011679187	0.000868766	
Sacramento	2040	OBUS	Aggregated	55	GAS	5040.604442	0.007831229	0.011427311	0.186020328	0.095932231	882.4076955	0.000835365	0.0120	0.1303	0.000768087	0.003	0.05586	0.143175365	0.059628087	0.008808735	0.003154605	
Sacramento	2040	SBUS	Aggregated	55	DSL	712.7561267	0.011102463	0.012639309	0.057753168	0.190599497	1008.906019	0.002367754	0.0120	0.7448	0.002265326	0.003	0.3192	0.759167754	0.324465326	0.009625432	0.00051568	
Sacramento	2040	SBUS	Aggregated	55	GAS	492.4359354	0.006104541	0.008907732	0.139920766	0.081555287	418.1810051	0.0008196	0.0080	0.7448	0.000753592	0.002	0.3192	0.7536196	0.321953592	0.004175478	0.00248819	
Sacramento	2040	UBUS	Aggregated	55	DSL	616.2720737	0.028593525	0.376245466	1.497085641	1.10638621	1264.55539	0.003737708	0.0120	0.8418	0.003576016	0.003	0.36078	0.857557708	0.367356016	0.015309864	0.006698846	
Sacramento	2040	UBUS	Aggregated	55	GAS	622.0868898	0.018105581	0.026419621	0.562354868	0.394140505	889.688496	0.000798212	0.0120	0.1303	0.000733926	0.003	0.05586	0.143138212	0.059593926	0.008887722	0.007303478	
Sacramento	2040	MCY	Aggregated	55	GAS	32929.44825	1.69680673	2.125955086	16.02895809	1.106068619	152.3716638	0.001754292	0.0040	0.0118	0.001635742	0.001	0.00504	0.017514292	0.007675742	0.001835342	0.365804881	
Sacramento	2040	LDA	Aggregated	60	DSL	31805.8705	0.002085036	0.002373674	0.066934039	0.006694218	180.1560805	0.00062812	0.0080	0.0368	0.000600948	0.002	0.01575	0.04537812	0.018350948	0.001719395	9.68459E-05	
Sacramento	2040	LDA	Aggregated	60	GAS	2296841.914	0.002988496	0.004360806	0.231788035	0.020814904	180.8855659	0.000611921	0.0080	0.0367	0.000562639	0.002	0.01575	0.045361921	0.018312639	0.001764151	0.001169905	
Sacramento	2040	LDT1	Aggregated	60	DSL	96.97014186	0.012180861	0.013867101	0.1518907	0.163316943	209.304741	0.006630407	0.0080	0.0368	0.006343579	0.002	0.01575	0.051380407	0.024093579	0.001997588	0.000565778	
Sacramento	2040	LDT1	Aggregated	60	GAS	159521.9403	0.003560822	0.005195942	0.255741235	0.024045247	195.537741	0.000647164	0.0080	0.0367	0.000595044	0.002	0.01575	0.045397164	0.018345044	0.001908669	0.001394985	
Sacramento	2040	LDT2	Aggregated	60	DSL	2206.209942	0.006760873	0.007696804	0.068955834	0.020549046	223.3292267	0.003237816	0.0080	0.0368	0.00309775	0.002	0.01575	0.047987816	0.02084775	0.002131436	0.00031403	
Sacramento	2040	LDT2	Aggregated	60	GAS	1008395.079	0.00403156	0.005882844	0.310446788	0.026209175	226.5988587	0.000633478	0.0080	0.0368	0.00058246	0.002	0.01575	0.045383478	0.01833246	0.001837308	0.001579464	
Sacramento	2040	HHDT	Aggregated	60	DSL	67156.12758	0.021661054	0.024659461	0.126464833	0.373783985	1289.316216	0.004305793	0.0360	0.0617	0.004119526	0.009	0.02646	0.102045793	0.039579526	0.012635763	0.00098857	
Sacramento	2040	HHDT	Aggregated	60	GAS	476.117678	0.243736388	0.355659565	22.49641145	2.912440981	1449.795785	0.00090045	0.0200	0.0617	0.00082793	0.005	0.02646	0.08264045	0.03228793	0.014827809	0.097717128	
Sacramento	2040	MDV	Aggregated	60	DSL	13372.74849	0.002418919	0.002753779	0.07582813	0.007131195	294.8859863	0.00079675	0.0080	0.0367	0.000762283	0.002	0.01575	0.04554675	0.018512283	0.002814368	0.000112354	
Sacramento	2040	MDV	Aggregated	60	GAS	479388.2783	0.005766857	0.008414985	0.381474667	0.037557747	300.0452987	0.000678471	0.0080	0.0367	0.000623829	0.002	0.01575	0.045428471	0.018373829	0.002195399	0.002259669	
Sacramento	2040	MH	Aggregated	60	DSL	943.4541206	0.023777735	0.027069371	0.083226566	1.660955063	866.5556539	0.026184603	0.0160	0.1303	0.025051869	0.004	0.05586	0.172524603	0.084911869	0.008270338	0.00110443	
Sacramento	2040	MH	Aggregated	60	GAS	2935.202557	0.008037605	0.011728455	0.156088657	0.109375116	891.6997105	0.000881841	0.0120	0.1303	0.000810821	0.003	0.05586	0.143221841	0.059670821	0.008900997	0.003233647	
Sacramento	2040	MHDT	Aggregated	60	DSL	135132.603	0.009810427	0.011168425	0.051457635	0.172892419	987.821214	0.002377086	0.0120	0.1303	0.002274255	0.003	0.05586	0.144717086	0.061134255	0.009424273	0.000455669	
Sacramento	2040	MHDT	Aggregated	60	GAS	10851.25946	0.007870374	0.011484431	0.163276789	0.093502287	887.4136339	0.000891556	0.0120	0.1303	0.000819753	0.003	0.05586	0.143231556	0.059679753	0.008858331	0.003166368	
Sacramento	2040	OBUS	Aggregated	60	DSL	8845.213123	0.016636875	0.018939816	0.095220689	0.237542624	1230.701642	0.003346821	0.0120	0.1303	0.003202039	0.003	0.05586	0.145686821	0.062062039	0.011532247	0.000745788	
Sacramento	2040	OBUS	Aggregated	60	GAS	5816.627518	0.0084239	0.012292135	0.174256569	0.097565671	887.8899397	0.00089745	0.0120	0.1303	0.000825172	0.003	0.05586	0.14323745	0.059685172	0.008863279	0.003389059	
Sacramento	2040	SBUS	Aggregated	60	DSL	396.6822573	0.009532144	0.010851621	0.049588956	0.172840949	996.194196	0.002302881	0.0120	0.7448	0.00220326	0.003	0.3192	0.759102881	0.32440326	0.009504156	0.000442743	
Sacramento	2040	SBUS	Aggregated	60	GAS	274.063724	0.00657788	0.009598426	0.13129538	0.082721752	420.7790903	0.000880514	0.0080	0.7448	0.0008096	0.002	0.3192	0.753680514	0.3220096	0.004201282	0.002673115	
Sacramento	2040	UBUS	Aggregated	60	DSL	932.8136924	0.03259908	0.388568925	1.451319952	1.118828482	1266.59644	0.00437468	0.0120	0.8418	0.004185433	0.003	0.36078	0.85819468	0.367965433	0.015334574	0.00796152	
Sacramento	2040	UBUS	Aggregated	60	GAS	941.6152272	0.019445936	0.028375463	0.526002995	0.401928124	895.2159745	0.000857536	0.0120	0.1303	0.000788472	0.003	0.05586	0.143197536	0.059648472	0.008942371	0.007846282	
Sacramento	2040	MCY	Aggregated	60	GAS	25421.10566	1.847164121	2.314187634	17.7265335	1.146605955	163.9483233	0.001897658	0.0040	0.0118	0.001769426	0.001	0.00504	0.017657658	0.007809426	0.001980702	0.396294464	
Sacramento	2040	LDA	Aggregated	65	DSL	4662.699996	0.002091272	0.002380774	0.067094386	0.006723007	202.5318956	0.000631938	0.0080	0.0368	0.000604601	0.002	0.01575	0.045381938	0.018354601	0.001932948	9.71356E-05	
Sacramento	2040	LDA	Aggregated	65	GAS	336714.0913	0.003428487	0.00500284	0.221350069	0.02139482	203.6528931	0.000693523	0.0080	0.0367	0.000637669	0.002	0.01575	0.045443523	0.018387669	0.00196952	0.001325799	
Sacramento	2040	LDT1	Aggregated	65	DSL	14.21569895	0.013052907	0.014859867	0.174312449	0.168398116	235.0963269	0.007164299	0.0080	0.0368	0.006854374	0.002	0.01575	0.051914299	0.024604374	0.002243741	0.000606282	
Sacramento	2040	LDT1	Aggregated	65	GAS	23385.71272	0.004077072	0.005949254	0.244237528	0.02476108	220.0928642	0.000733339	0.0080	0.0367	0.000674278	0.002	0.01575	0.045483339	0.018424278	0.002130849	0.001578133	
Sacramento	2040	LDT2	Aggregated	65	DSL	323.42756	0.006764063	0.007700436	0.069037866	0.020540385	250.8489806	0.00323977	0.0080	0.0368	0.003099619	0.002	0.01575	0.04798977	0.020849619	0.002394083	0.000314178	
Sacramento	2040	LDT2	Aggregated	65	GAS	147829.4308	0.00462169	0.006743959	0.296371796	0.026958826	255.05014	0.000717922	0.0080	0.0368	0.000660103	0.002	0.01575	0.045467922	0.018410103	0.002051011	0.00178901	
Sacramento	2040	HHDT	Aggregated	65	DSL	36782.75962	0.021661054	0.024659461	0.126464833	0.373851533	1289.316216	0.004305793	0.0360	0.0617	0.004119526	0.009	0.02646	0.102045793	0.039579526	0.012635763	0.00098857	
Sacramento	2040	HHDT	Aggregated	65	GAS	255.1892217	0.275641435	0.402215334	21.06023991	3.027700379	1445.841796	0.001020538	0.0200	0.0617	0.000938347	0.005	0.02646	0.082760538	0.032398347	0.01476808	0.110749107	
Sacramento	2040	MDV	Aggregated	65	DSL	1960.427849	0.002422084	0.002757382	0.075909512	0.007140707	331.1156304	0.000798688	0.0080	0.0367	0.000764137	0.002	0.01575	0.045548688	0.018514137	0.003160141	0.000112501	
Sacramento	2040	MDV	Aggregated	65	GAS	70277.70937	0.006591832	0.009618785	0.364448155	0.038908871	337.7085663	0.000768695	0.0080	0.0367	0.000706787	0.002	0.01575	0.045518695	0.018456787	0.002450729	0.002552226	
Sacramento	2040	MH	Aggregated	65	DSL	148.472854	0.024731473	0.028155138	0.085812762	1.665907871	879.4042221	0.02899579	0.0160	0.1303	0.027741445	0.004	0.05586	0.17533579	0.087601445	0.008392964	0.001148729	
Sacramento	2040	MH	Aggregated	65	GAS	458.6625551	0.009175746	0.013389227	0.147467962	0.111672462	908.2297635	0.000999448	0.0120	0.1303	0.000918955	0.003	0.05586	0.143339448	0.059778955	0.009065844	0.0036649	
Sacramento	2040	MHDT	Aggregated	65	DSL	21266.02958	0.009810427	0.011168425	0.051457635	0.172422054	987.821214	0.002377086	0.0120	0.1303	0.002274255	0.003	0.05586	0.144717086	0.061134255	0.009424273	0.000455669	
Sacramento	2040	MHDT	Aggregated	65	GAS	1695.646653	0.008984834	0.013110649	0.154259098	0.095466235	903.8642328	0.001010458	0.0120	0.1303	0.000929079	0.003	0.05586	0.143350458	0.059789079	0.009022378	0.003588648	
Sacramento	2040	OBUS	Aggregated	65	DSL	1149.111672	0.015592724	0.01775113	0.088417727	0.229151878	1191.240871	0.003211429	0.0120	0.1303	0.003072504	0.003	0.05586	0.145551429	0.061932504	0.011532247	0.000745788	
Sacramento	2040	OBUS	Aggregated	65	GAS	908.9216803	0.009616741	0.014032726	0.164632469	0.099614968	904.3493683	0.001017138	0.0120	0.1303	0.000935221	0.003	0.05586	0.143357138	0.059795221	0.009027406	0.003841039	
Sacramento	2040	SBUS	Aggregated	65	DSL	0	0	0	0	0	0	0	0.0120	0.7448	0	0.003	0.3192	0.7568	0.3222	0.009504156	0.000442743	
Sacramento	2040	UBUS	Aggregated	65	DSL	140.3864976	0.039203337	0.42837097	1.489428274	1.141069967	1285.376481	0.005261332	0.0120	0.8418	0.005033729	0.003	0.36078	0.859081332	0.368813729	0.015561943	0.009904609	
Sacramento	2040	UBUS	Aggregated	65	GAS	141.7111101	0.022168166	0.032347736	0.496272963	0.411618066	911.8112108	0.0009719	0.0120	0.1303	0.000893627	0.003	0.05586	0.1433119	0.059753627	0.009107575	0.008892696	
Sacramento	2040	MCY	Aggregated	65	GAS	3726.701624	2.095519467	2.625354757	20.35245414	1.176896196	183.0904931	0.00215967	0.0040	0.0118	0.002013738	0.001	0.00504	0.01791967	0.008053738	0.002224267	0.451417982	
Sacramento	2040	LDA	Aggregated	70	DSL	1233.615174	0.00209562	0.002385724	0.067206621	0.006763292	218.7024209	0.0006346	0.0080	0.0368	0.000607148	0.002	0.01575	0.0453846	0.018357148	0.002087279	9.73375E-05	
Sacramento	2040	LDA	Aggregated	70	GAS	89084.78192	0.00361965	0.005281785	0.206025845	0.022336816	214.1926917	0.000753281	0.0080	0.0367	0.000692614	0.002	0.01575	0.045503281	0.018442614	0.00211024	0.001439967	

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4	
Sacramento	2040	LDT1	Aggregated	70	DSL	3.761061607	0.013660914	0.015552043	0.190006469	0.171586459	253.646461	0.007536538	0.0080	0.0368	0.007210511	0.002	0.01575	0.052286538	0.024960511	0.002420782	0.000634523	
Sacramento	2040	LDT1	Aggregated	70	GAS	6187.181268	0.004302653	0.006278422	0.227653171	0.025895013	231.6208611	0.000796452	0.0080	0.0367	0.000732308	0.002	0.01575	0.045546452	0.018482308	0.00228309	0.001712422	
Sacramento	2040	LDT2	Aggregated	70	DSL	85.56955112	0.006766288	0.007702969	0.069095283	0.020615171	270.6420683	0.003241131	0.0080	0.0368	0.003100922	0.002	0.01575	0.047991131	0.020850922	0.002582986	0.000314281	
Sacramento	2040	LDT2	Aggregated	70	GAS	39111.37949	0.004880595	0.007121752	0.276180269	0.028174356	268.4198821	0.000779762	0.0080	0.0368	0.000716963	0.002	0.01575	0.045529762	0.018466963	0.002197457	0.001942524	
Sacramento	2040	HHDT	Aggregated	70	DSL	0	0	0	0	0	0	0	0.0360	0.0617	0	0.009	0.02646	0.09774	0.03546	0.012635763	0.00098857	
Sacramento	2040	MDV	Aggregated	70	DSL	518.6723454	0.002424291	0.002759894	0.075966474	0.007172966	356.4514971	0.000800039	0.0080	0.0367	0.00076543	0.002	0.01575	0.045550039	0.01851543	0.003401945	0.000112604	
Sacramento	2040	MDV	Aggregated	70	GAS	18593.44344	0.006951625	0.010143795	0.339881253	0.040847871	355.4351276	0.000834781	0.0080	0.0367	0.00076755	0.002	0.01575	0.045584781	0.01851755	0.002625702	0.002766985	
Sacramento	2040	MHDT	Aggregated	70	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.009424273	0.000455669	
Sacramento	2040	OBUS	Aggregated	70	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.011532247	0.000745788	
Sacramento	2040	SBUS	Aggregated	70	DSL	0	0	0	0	0	0	0	0.0120	0.7448	0	0.003	0.3192	0.7568	0.3222	0.009504156	0.000442743	
Sacramento	2040	MCY	Aggregated	70	GAS	985.977154	2.301754967	2.883527957	22.72044036	1.229620516	196.2024278	0.002348177	0.0040	0.0118	0.002189508	0.001	0.00504	0.018108177	0.008229508	0.002393324	0.490928995	
Sacramento	2040	HHDT	Aggregated	75	DSL	0	0	0	0	0	0	0	0.0360	0.0617	0	0.009	0.02646	0.09774	0.03546	0.012635763	0.00098857	
Sacramento	2040	MHDT	Aggregated	75	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.009424273	0.000455669	
Sacramento	2040	OBUS	Aggregated	75	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.011532247	0.000745788	
Sacramento	2040	SBUS	Aggregated	75	DSL	0	0	0	0	0	0	0	0.0120	0.7448	0	0.003	0.3192	0.7568	0.3222	0.009504156	0.000442743	
Sacramento	2040	HHDT	Aggregated	80	DSL	0	0	0	0	0	0	0	0.0360	0.0617	0	0.009	0.02646	0.09774	0.03546	0.012635763	0.00098857	
Sacramento	2040	MHDT	Aggregated	80	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.009424273	0.000455669	
Sacramento	2040	OBUS	Aggregated	80	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.011532247	0.000745788	
Sacramento	2040	SBUS	Aggregated	80	DSL	0	0	0	0	0	0	0	0.0120	0.7448	0	0.003	0.3192	0.7568	0.3222	0.009504156	0.000442743	
Sacramento	2040	HHDT	Aggregated	85	DSL	0	0	0	0	0	0	0	0.0360	0.0617	0	0.009	0.02646	0.09774	0.03546	0.012635763	0.00098857	
Sacramento	2040	MHDT	Aggregated	85	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.009424273	0.000455669	
Sacramento	2040	OBUS	Aggregated	85	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.011532247	0.000745788	
Sacramento	2040	SBUS	Aggregated	85	DSL	0	0	0	0	0	0	0	0.0120	0.7448	0	0.003	0.3192	0.7568	0.3222	0.009504156	0.000442743	
Sacramento	2040	HHDT	Aggregated	90	DSL	0	0	0	0	0	0	0	0.0360	0.0617	0	0.009	0.02646	0.09774	0.03546	0.012635763	0.00098857	
Sacramento	2040	MHDT	Aggregated	90	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.009424273	0.000455669	
Sacramento	2040	OBUS	Aggregated	90	DSL	0	0	0	0	0	0	0	0.0120	0.1303	0	0.003	0.05586	0.14234	0.05886	0.011532247	0.000745788	
Sacramento	2040	SBUS	Aggregated	90	DSL	0	0	0	0	0	0	0	0.0120	0.7448	0	0.003	0.3192	0.7568	0.3222	0.009504156	0.000442743	

calendar_year	season_month	vehicle_class	fuel	temperature	relative_humidity	process	speed_time	pollutant	emission_rate
2008	Annual	HHDT	Dsl			PMBW		PM10	0.06174
2008	Annual	HHDT	Dsl			PMTW		PM10	0.036
2020	Annual	HHDT	Dsl			PMBW		PM10	0.06174
2020	Annual	HHDT	Dsl			PMTW		PM10	0.036
2040	Annual	HHDT	Dsl			PMBW		PM10	0.06174
2040	Annual	HHDT	Dsl			PMTW		PM10	0.036
2008	Annual	HHDT	Gas			PMBW		PM10	0.06174
2008	Annual	HHDT	Gas			PMTW		PM10	0.02
2020	Annual	HHDT	Gas			PMBW		PM10	0.06174
2020	Annual	HHDT	Gas			PMTW		PM10	0.02
2040	Annual	HHDT	Gas			PMBW		PM10	0.06174
2040	Annual	HHDT	Gas			PMTW		PM10	0.02
2008	Annual	HHDT	NG			PMBW		PM10	0.06174
2008	Annual	HHDT	NG			PMTW		PM10	0.036
2020	Annual	HHDT	NG			PMBW		PM10	0.06174
2020	Annual	HHDT	NG			PMTW		PM10	0.036
2040	Annual	HHDT	NG			PMBW		PM10	0.06174
2040	Annual	HHDT	NG			PMTW		PM10	0.036
2008	Annual	LDA	Dsl			PMBW		PM10	0.03675
2008	Annual	LDA	Dsl			PMTW		PM10	0.008
2020	Annual	LDA	Dsl			PMBW		PM10	0.03675
2020	Annual	LDA	Dsl			PMTW		PM10	0.008
2040	Annual	LDA	Dsl			PMBW		PM10	0.03675
2040	Annual	LDA	Dsl			PMTW		PM10	0.008
2008	Annual	LDA	Elec			PMBW		PM10	0.03675
2008	Annual	LDA	Elec			PMTW		PM10	0.008
2020	Annual	LDA	Elec			PMBW		PM10	0.03675
2020	Annual	LDA	Elec			PMTW		PM10	0.008
2040	Annual	LDA	Elec			PMBW		PM10	0.03675
2040	Annual	LDA	Elec			PMTW		PM10	0.008
2008	Annual	LDA	Gas			PMBW		PM10	0.03675
2008	Annual	LDA	Gas			PMTW		PM10	0.008
2020	Annual	LDA	Gas			PMBW		PM10	0.03675
2020	Annual	LDA	Gas			PMTW		PM10	0.008
2040	Annual	LDA	Gas			PMBW		PM10	0.03675
2040	Annual	LDA	Gas			PMTW		PM10	0.008
2008	Annual	LDT1	Dsl			PMBW		PM10	0.03675
2008	Annual	LDT1	Dsl			PMTW		PM10	0.008
2020	Annual	LDT1	Dsl			PMBW		PM10	0.03675

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4
2020	Annual	LDT1	Dsl			PMTW		PM10	0.008												
2040	Annual	LDT1	Dsl			PMBW		PM10	0.03675												
2040	Annual	LDT1	Dsl			PMTW		PM10	0.008												
2008	Annual	LDT1	Elec			PMBW		PM10	0.03675												
2008	Annual	LDT1	Elec			PMTW		PM10	0.008												
2020	Annual	LDT1	Elec			PMBW		PM10	0.03675												
2020	Annual	LDT1	Elec			PMTW		PM10	0.008												
2040	Annual	LDT1	Elec			PMBW		PM10	0.03675												
2040	Annual	LDT1	Elec			PMTW		PM10	0.008												
2008	Annual	LDT1	Gas			PMBW		PM10	0.03675												
2008	Annual	LDT1	Gas			PMTW		PM10	0.008												
2020	Annual	LDT1	Gas			PMBW		PM10	0.03675												
2020	Annual	LDT1	Gas			PMTW		PM10	0.008												
2040	Annual	LDT1	Gas			PMBW		PM10	0.03675												
2040	Annual	LDT1	Gas			PMTW		PM10	0.008												
2008	Annual	LDT2	Dsl			PMBW		PM10	0.03675												
2008	Annual	LDT2	Dsl			PMTW		PM10	0.008												
2020	Annual	LDT2	Dsl			PMBW		PM10	0.03675												
2020	Annual	LDT2	Dsl			PMTW		PM10	0.008												
2040	Annual	LDT2	Dsl			PMBW		PM10	0.03675												
2040	Annual	LDT2	Dsl			PMTW		PM10	0.008												
2008	Annual	LDT2	Gas			PMBW		PM10	0.03675												
2008	Annual	LDT2	Gas			PMTW		PM10	0.008												
2020	Annual	LDT2	Gas			PMBW		PM10	0.03675												
2020	Annual	LDT2	Gas			PMTW		PM10	0.008												
2040	Annual	LDT2	Gas			PMBW		PM10	0.03675												
2040	Annual	LDT2	Gas			PMTW		PM10	0.008												
2008	Annual	LHDT1	Dsl			PMBW		PM10	0.07644												
2008	Annual	LHDT1	Dsl			PMTW		PM10	0.012												
2020	Annual	LHDT1	Dsl			PMBW		PM10	0.07644												
2020	Annual	LHDT1	Dsl			PMTW		PM10	0.012												
2040	Annual	LHDT1	Dsl			PMBW		PM10	0.07644												
2040	Annual	LHDT1	Dsl			PMTW		PM10	0.012												
2008	Annual	LHDT1	Gas			PMBW		PM10	0.07644												
2008	Annual	LHDT1	Gas			PMTW		PM10	0.008												
2020	Annual	LHDT1	Gas			PMBW		PM10	0.07644												
2020	Annual	LHDT1	Gas			PMTW		PM10	0.008												
2040	Annual	LHDT1	Gas			PMBW		PM10	0.07644												
2040	Annual	LHDT1	Gas			PMTW		PM10	0.008												
2008	Annual	LHDT2	Dsl			PMBW		PM10	0.08918												
2008	Annual	LHDT2	Dsl			PMTW		PM10	0.012												
2020	Annual	LHDT2	Dsl			PMBW		PM10	0.08918												
2020	Annual	LHDT2	Dsl			PMTW		PM10	0.012												
2040	Annual	LHDT2	Dsl			PMBW		PM10	0.08918												
2040	Annual	LHDT2	Dsl			PMTW		PM10	0.012												
2008	Annual	LHDT2	Gas			PMBW		PM10	0.08918												
2008	Annual	LHDT2	Gas			PMTW		PM10	0.008												
2020	Annual	LHDT2	Gas			PMBW		PM10	0.08918												
2020	Annual	LHDT2	Gas			PMTW		PM10	0.008												
2040	Annual	LHDT2	Gas			PMBW		PM10	0.08918												
2040	Annual	LHDT2	Gas			PMTW		PM10	0.008												
2008	Annual	MCY	Gas			PMBW		PM10	0.01176												
2008	Annual	MCY	Gas			PMTW		PM10	0.004												
2020	Annual	MCY	Gas			PMBW		PM10	0.01176												
2020	Annual	MCY	Gas			PMTW		PM10	0.004												
2040	Annual	MCY	Gas			PMBW		PM10	0.01176												
2040	Annual	MCY	Gas			PMTW		PM10	0.004												
2008	Annual	MDV	Dsl			PMBW		PM10	0.03675												
2008	Annual	MDV	Dsl			PMTW		PM10	0.008												
2020	Annual	MDV	Dsl			PMBW		PM10	0.03675												
2020	Annual	MDV	Dsl			PMTW		PM10	0.008												
2040	Annual	MDV	Dsl			PMBW		PM10	0.03675												
2040	Annual	MDV	Dsl			PMTW		PM10	0.008												
2008	Annual	MDV	Gas			PMBW		PM10	0.03675												
2008	Annual	MDV	Gas			PMTW		PM10	0.008												
2020	Annual	MDV	Gas			PMBW		PM10	0.03675												
2020	Annual	MDV	Gas			PMTW		PM10	0.008												
2040	Annual	MDV	Gas			PMBW		PM10	0.03675												
2040	Annual	MDV	Gas			PMTW		PM10	0.008												
2008	Annual	MH	Dsl			PMBW		PM10	0.13034												
2008	Annual	MH	Dsl			PMTW		PM10	0.016												
2020	Annual	MH	Dsl			PMBW		PM10	0.13034												

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4
2020	Annual	MH	Dsl			PMTW		PM10	0.016												
2040	Annual	MH	Dsl			PMBW		PM10	0.13034												
2040	Annual	MH	Dsl			PMTW		PM10	0.016												
2008	Annual	MH	Gas			PMBW		PM10	0.13034												
2008	Annual	MH	Gas			PMTW		PM10	0.012												
2020	Annual	MH	Gas			PMBW		PM10	0.13034												
2020	Annual	MH	Gas			PMTW		PM10	0.012												
2040	Annual	MH	Gas			PMBW		PM10	0.13034												
2040	Annual	MH	Gas			PMTW		PM10	0.012												
2008	Annual	MHDT	Dsl			PMBW		PM10	0.13034												
2008	Annual	MHDT	Dsl			PMTW		PM10	0.012												
2020	Annual	MHDT	Dsl			PMBW		PM10	0.13034												
2020	Annual	MHDT	Dsl			PMTW		PM10	0.012												
2040	Annual	MHDT	Dsl			PMBW		PM10	0.13034												
2040	Annual	MHDT	Dsl			PMTW		PM10	0.012												
2008	Annual	MHDT	Gas			PMBW		PM10	0.13034												
2008	Annual	MHDT	Gas			PMTW		PM10	0.012												
2020	Annual	MHDT	Gas			PMBW		PM10	0.13034												
2020	Annual	MHDT	Gas			PMTW		PM10	0.012												
2040	Annual	MHDT	Gas			PMBW		PM10	0.13034												
2040	Annual	MHDT	Gas			PMTW		PM10	0.012												
2008	Annual	OBUS	Dsl			PMBW		PM10	0.13034												
2008	Annual	OBUS	Dsl			PMTW		PM10	0.012												
2020	Annual	OBUS	Dsl			PMBW		PM10	0.13034												
2020	Annual	OBUS	Dsl			PMTW		PM10	0.012												
2040	Annual	OBUS	Dsl			PMBW		PM10	0.13034												
2040	Annual	OBUS	Dsl			PMTW		PM10	0.012												
2008	Annual	OBUS	Gas			PMBW		PM10	0.13034												
2008	Annual	OBUS	Gas			PMTW		PM10	0.012												
2020	Annual	OBUS	Gas			PMBW		PM10	0.13034												
2020	Annual	OBUS	Gas			PMTW		PM10	0.012												
2040	Annual	OBUS	Gas			PMBW		PM10	0.13034												
2040	Annual	OBUS	Gas			PMTW		PM10	0.012												
2008	Annual	SBUS	Dsl			PMBW		PM10	0.7448												
2008	Annual	SBUS	Dsl			PMTW		PM10	0.012												
2020	Annual	SBUS	Dsl			PMBW		PM10	0.7448												
2020	Annual	SBUS	Dsl			PMTW		PM10	0.012												
2040	Annual	SBUS	Dsl			PMBW		PM10	0.7448												
2040	Annual	SBUS	Dsl			PMTW		PM10	0.012												
2008	Annual	SBUS	Gas			PMBW		PM10	0.7448												
2008	Annual	SBUS	Gas			PMTW		PM10	0.008												
2020	Annual	SBUS	Gas			PMBW		PM10	0.7448												
2020	Annual	SBUS	Gas			PMTW		PM10	0.008												
2040	Annual	SBUS	Gas			PMBW		PM10	0.7448												
2040	Annual	SBUS	Gas			PMTW		PM10	0.008												
2008	Annual	UBUS	Dsl			PMBW		PM10	0.84182												
2008	Annual	UBUS	Dsl			PMTW		PM10	0.012												
2020	Annual	UBUS	Dsl			PMBW		PM10	0.84182												
2020	Annual	UBUS	Dsl			PMTW		PM10	0.012												
2040	Annual	UBUS	Dsl			PMBW		PM10	0.84182												
2040	Annual	UBUS	Dsl			PMTW		PM10	0.012												
2008	Annual	UBUS	Gas			PMBW		PM10	0.13034												
2008	Annual	UBUS	Gas			PMTW		PM10	0.012												
2020	Annual	UBUS	Gas			PMBW		PM10	0.13034												
2020	Annual	UBUS	Gas			PMTW		PM10	0.012												
2040	Annual	UBUS	Gas			PMBW		PM10	0.13034												
2040	Annual	UBUS	Gas			PMTW		PM10	0.012												
2008	Annual	UBUS	NG			PMBW		PM10	0.84182												
2008	Annual	UBUS	NG			PMTW		PM10	0.012												
2020	Annual	UBUS	NG			PMBW		PM10	0.84182												
2020	Annual	UBUS	NG			PMTW		PM10	0.012												
2040	Annual	UBUS	NG			PMBW		PM10	0.84182												
2040	Annual	UBUS	NG			PMTW		PM10	0.012												
2008	Annual	HHDT	Dsl			PMBW		PM2_5	0.02646												
2008	Annual	HHDT	Dsl			PMTW		PM2_5	0.009												
2020	Annual	HHDT	Dsl			PMBW		PM2_5	0.02646												
2020	Annual	HHDT	Dsl			PMTW		PM2_5	0.009												
2040	Annual	HHDT	Dsl			PMBW		PM2_5	0.02646												
2040	Annual	HHDT	Dsl			PMTW		PM2_5	0.009												
2008	Annual	HHDT	Gas			PMBW		PM2_5	0.02646												
2008	Annual	HHDT	Gas			PMTW		PM2_5	0.005												

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4
2020	Annual	HHDT	Gas			PMBW		PM2_5	0.02646												
2020	Annual	HHDT	Gas			PMTW		PM2_5	0.005												
2040	Annual	HHDT	Gas			PMBW		PM2_5	0.02646												
2040	Annual	HHDT	Gas			PMTW		PM2_5	0.005												
2008	Annual	HHDT	NG			PMBW		PM2_5	0.02646												
2008	Annual	HHDT	NG			PMTW		PM2_5	0.009												
2020	Annual	HHDT	NG			PMBW		PM2_5	0.02646												
2020	Annual	HHDT	NG			PMTW		PM2_5	0.009												
2040	Annual	HHDT	NG			PMBW		PM2_5	0.02646												
2040	Annual	HHDT	NG			PMTW		PM2_5	0.009												
2008	Annual	LDA	Dsl			PMBW		PM2_5	0.01575												
2008	Annual	LDA	Dsl			PMTW		PM2_5	0.002												
2020	Annual	LDA	Dsl			PMBW		PM2_5	0.01575												
2020	Annual	LDA	Dsl			PMTW		PM2_5	0.002												
2040	Annual	LDA	Dsl			PMBW		PM2_5	0.01575												
2040	Annual	LDA	Dsl			PMTW		PM2_5	0.002												
2008	Annual	LDA	Elec			PMBW		PM2_5	0.01575												
2008	Annual	LDA	Elec			PMTW		PM2_5	0.002												
2020	Annual	LDA	Elec			PMBW		PM2_5	0.01575												
2020	Annual	LDA	Elec			PMTW		PM2_5	0.002												
2040	Annual	LDA	Elec			PMBW		PM2_5	0.01575												
2040	Annual	LDA	Elec			PMTW		PM2_5	0.002												
2008	Annual	LDA	Gas			PMBW		PM2_5	0.01575												
2008	Annual	LDA	Gas			PMTW		PM2_5	0.002												
2020	Annual	LDA	Gas			PMBW		PM2_5	0.01575												
2020	Annual	LDA	Gas			PMTW		PM2_5	0.002												
2040	Annual	LDA	Gas			PMBW		PM2_5	0.01575												
2040	Annual	LDA	Gas			PMTW		PM2_5	0.002												
2008	Annual	LDT1	Dsl			PMBW		PM2_5	0.01575												
2008	Annual	LDT1	Dsl			PMTW		PM2_5	0.002												
2020	Annual	LDT1	Dsl			PMBW		PM2_5	0.01575												
2020	Annual	LDT1	Dsl			PMTW		PM2_5	0.002												
2040	Annual	LDT1	Dsl			PMBW		PM2_5	0.01575												
2040	Annual	LDT1	Dsl			PMTW		PM2_5	0.002												
2008	Annual	LDT1	Elec			PMBW		PM2_5	0.01575												
2008	Annual	LDT1	Elec			PMTW		PM2_5	0.002												
2020	Annual	LDT1	Elec			PMBW		PM2_5	0.01575												
2020	Annual	LDT1	Elec			PMTW		PM2_5	0.002												
2040	Annual	LDT1	Elec			PMBW		PM2_5	0.01575												
2040	Annual	LDT1	Elec			PMTW		PM2_5	0.002												
2008	Annual	LDT1	Gas			PMBW		PM2_5	0.01575												
2008	Annual	LDT1	Gas			PMTW		PM2_5	0.002												
2020	Annual	LDT1	Gas			PMBW		PM2_5	0.01575												
2020	Annual	LDT1	Gas			PMTW		PM2_5	0.002												
2040	Annual	LDT1	Gas			PMBW		PM2_5	0.01575												
2040	Annual	LDT1	Gas			PMTW		PM2_5	0.002												
2008	Annual	LDT2	Dsl			PMBW		PM2_5	0.01575												
2008	Annual	LDT2	Dsl			PMTW		PM2_5	0.002												
2020	Annual	LDT2	Dsl			PMBW		PM2_5	0.01575												
2020	Annual	LDT2	Dsl			PMTW		PM2_5	0.002												
2040	Annual	LDT2	Dsl			PMBW		PM2_5	0.01575												
2040	Annual	LDT2	Dsl			PMTW		PM2_5	0.002												
2008	Annual	LDT2	Gas			PMBW		PM2_5	0.01575												
2008	Annual	LDT2	Gas			PMTW		PM2_5	0.002												
2020	Annual	LDT2	Gas			PMBW		PM2_5	0.01575												
2020	Annual	LDT2	Gas			PMTW		PM2_5	0.002												
2040	Annual	LDT2	Gas			PMBW		PM2_5	0.01575												
2040	Annual	LDT2	Gas			PMTW		PM2_5	0.002												
2008	Annual	LHDT1	Dsl			PMBW		PM2_5	0.03276												
2008	Annual	LHDT1	Dsl			PMTW		PM2_5	0.003												
2020	Annual	LHDT1	Dsl			PMBW		PM2_5	0.03276												
2020	Annual	LHDT1	Dsl			PMTW		PM2_5	0.003												
2040	Annual	LHDT1	Dsl			PMBW		PM2_5	0.03276												
2040	Annual	LHDT1	Dsl			PMTW		PM2_5	0.003												
2008	Annual	LHDT1	Gas			PMBW		PM2_5	0.03276												
2008	Annual	LHDT1	Gas			PMTW		PM2_5	0.002												
2020	Annual	LHDT1	Gas			PMBW		PM2_5	0.03276												
2020	Annual	LHDT1	Gas			PMTW		PM2_5	0.002												
2040	Annual	LHDT1	Gas			PMBW		PM2_5	0.03276												
2040	Annual	LHDT1	Gas			PMTW		PM2_5	0.002												
2008	Annual	LHDT2	Dsl			PMBW		PM2_5	0.03822												
2008	Annual	LHDT2	Dsl			PMTW		PM2_5	0.003												

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4
2020	Annual	LHDT2	Dsl			PMBW		PM2_5	0.03822												
2020	Annual	LHDT2	Dsl			PMTW		PM2_5	0.003												
2040	Annual	LHDT2	Dsl			PMBW		PM2_5	0.03822												
2040	Annual	LHDT2	Dsl			PMTW		PM2_5	0.003												
2008	Annual	LHDT2	Gas			PMBW		PM2_5	0.03822												
2008	Annual	LHDT2	Gas			PMTW		PM2_5	0.002												
2020	Annual	LHDT2	Gas			PMBW		PM2_5	0.03822												
2020	Annual	LHDT2	Gas			PMTW		PM2_5	0.002												
2040	Annual	LHDT2	Gas			PMBW		PM2_5	0.03822												
2040	Annual	LHDT2	Gas			PMTW		PM2_5	0.002												
2008	Annual	MCY	Gas			PMBW		PM2_5	0.00504												
2008	Annual	MCY	Gas			PMTW		PM2_5	0.001												
2020	Annual	MCY	Gas			PMBW		PM2_5	0.00504												
2020	Annual	MCY	Gas			PMTW		PM2_5	0.001												
2040	Annual	MCY	Gas			PMBW		PM2_5	0.00504												
2040	Annual	MCY	Gas			PMTW		PM2_5	0.001												
2008	Annual	MDV	Dsl			PMBW		PM2_5	0.01575												
2008	Annual	MDV	Dsl			PMTW		PM2_5	0.002												
2020	Annual	MDV	Dsl			PMBW		PM2_5	0.01575												
2020	Annual	MDV	Dsl			PMTW		PM2_5	0.002												
2040	Annual	MDV	Dsl			PMBW		PM2_5	0.01575												
2040	Annual	MDV	Dsl			PMTW		PM2_5	0.002												
2008	Annual	MDV	Gas			PMBW		PM2_5	0.01575												
2008	Annual	MDV	Gas			PMTW		PM2_5	0.002												
2020	Annual	MDV	Gas			PMBW		PM2_5	0.01575												
2020	Annual	MDV	Gas			PMTW		PM2_5	0.002												
2040	Annual	MDV	Gas			PMBW		PM2_5	0.01575												
2040	Annual	MDV	Gas			PMTW		PM2_5	0.002												
2008	Annual	MH	Dsl			PMBW		PM2_5	0.05586												
2008	Annual	MH	Dsl			PMTW		PM2_5	0.004												
2020	Annual	MH	Dsl			PMBW		PM2_5	0.05586												
2020	Annual	MH	Dsl			PMTW		PM2_5	0.004												
2040	Annual	MH	Dsl			PMBW		PM2_5	0.05586												
2040	Annual	MH	Dsl			PMTW		PM2_5	0.004												
2008	Annual	MH	Gas			PMBW		PM2_5	0.05586												
2008	Annual	MH	Gas			PMTW		PM2_5	0.003												
2020	Annual	MH	Gas			PMBW		PM2_5	0.05586												
2020	Annual	MH	Gas			PMTW		PM2_5	0.003												
2040	Annual	MH	Gas			PMBW		PM2_5	0.05586												
2040	Annual	MH	Gas			PMTW		PM2_5	0.003												
2008	Annual	MHDT	Dsl			PMBW		PM2_5	0.05586												
2008	Annual	MHDT	Dsl			PMTW		PM2_5	0.003												
2020	Annual	MHDT	Dsl			PMBW		PM2_5	0.05586												
2020	Annual	MHDT	Dsl			PMTW		PM2_5	0.003												
2040	Annual	MHDT	Dsl			PMBW		PM2_5	0.05586												
2040	Annual	MHDT	Dsl			PMTW		PM2_5	0.003												
2008	Annual	MHDT	Gas			PMBW		PM2_5	0.05586												
2008	Annual	MHDT	Gas			PMTW		PM2_5	0.003												
2020	Annual	MHDT	Gas			PMBW		PM2_5	0.05586												
2020	Annual	MHDT	Gas			PMTW		PM2_5	0.003												
2040	Annual	MHDT	Gas			PMBW		PM2_5	0.05586												
2040	Annual	MHDT	Gas			PMTW		PM2_5	0.003												
2008	Annual	OBUS	Dsl			PMBW		PM2_5	0.05586												
2008	Annual	OBUS	Dsl			PMTW		PM2_5	0.003												
2020	Annual	OBUS	Dsl			PMBW		PM2_5	0.05586												
2020	Annual	OBUS	Dsl			PMTW		PM2_5	0.003												
2040	Annual	OBUS	Dsl			PMBW		PM2_5	0.05586												
2040	Annual	OBUS	Dsl			PMTW		PM2_5	0.003												
2008	Annual	OBUS	Gas			PMBW		PM2_5	0.05586												
2008	Annual	OBUS	Gas			PMTW		PM2_5	0.003												
2020	Annual	OBUS	Gas			PMBW		PM2_5	0.05586												
2020	Annual	OBUS	Gas			PMTW		PM2_5	0.003												
2040	Annual	OBUS	Gas			PMBW		PM2_5	0.05586												
2040	Annual	OBUS	Gas			PMTW		PM2_5	0.003												
2008	Annual	SBUS	Dsl			PMBW		PM2_5	0.3192												
2008	Annual	SBUS	Dsl			PMTW		PM2_5	0.003												
2020	Annual	SBUS	Dsl			PMBW		PM2_5	0.3192												
2020	Annual	SBUS	Dsl			PMTW		PM2_5	0.003												
2040	Annual	SBUS	Dsl			PMBW		PM2_5	0.3192												
2040	Annual	SBUS	Dsl			PMTW		PM2_5	0.003												
2008	Annual	SBUS	Gas			PMBW		PM2_5	0.3192												
2008	Annual	SBUS	Gas			PMTW		PM2_5	0.002												

Region	CalYr	VehClass	MdlYr	Speed	Fuel	VMT	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	PM10_RUNEX	PM10_TW	PM10_BW	PM2_5_RUNEX	PM25_TW	PM25_BW	PM10_Total	PM25_Total	SOx	CH4
2020	Annual	SBUS	Gas			PMBW		PM2_5	0.3192												
2020	Annual	SBUS	Gas			PMTW		PM2_5	0.002												
2040	Annual	SBUS	Gas			PMBW		PM2_5	0.3192												
2040	Annual	SBUS	Gas			PMTW		PM2_5	0.002												
2008	Annual	UBUS	Dsl			PMBW		PM2_5	0.36078												
2008	Annual	UBUS	Dsl			PMTW		PM2_5	0.003												
2020	Annual	UBUS	Dsl			PMBW		PM2_5	0.36078												
2020	Annual	UBUS	Dsl			PMTW		PM2_5	0.003												
2040	Annual	UBUS	Dsl			PMBW		PM2_5	0.36078												
2040	Annual	UBUS	Dsl			PMTW		PM2_5	0.003												
2008	Annual	UBUS	Gas			PMBW		PM2_5	0.05586												
2008	Annual	UBUS	Gas			PMTW		PM2_5	0.003												
2020	Annual	UBUS	Gas			PMBW		PM2_5	0.05586												
2020	Annual	UBUS	Gas			PMTW		PM2_5	0.003												
2040	Annual	UBUS	Gas			PMBW		PM2_5	0.05586												
2040	Annual	UBUS	Gas			PMTW		PM2_5	0.003												
2008	Annual	UBUS	NG			PMBW		PM2_5	0.36078												
2008	Annual	UBUS	NG			PMTW		PM2_5	0.003												
2020	Annual	UBUS	NG			PMBW		PM2_5	0.36078												
2020	Annual	UBUS	NG			PMTW		PM2_5	0.003												
2040	Annual	UBUS	NG			PMBW		PM2_5	0.36078												
2040	Annual	UBUS	NG			PMTW		PM2_5	0.003												

Appendix F

Meteorological Data

California Environmental Protection Agency
Air Resources Board

Top 4 Summary: Highest 4 Daily Maximum State 24-Hour Sulfur Dioxide Averages

at Sacramento-Del Paso Manor

	2010		2011		2012	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
First High:	Jan 29	0.001	Sep 6	0.001	Aug 14	0.002
Second High:	Jan 27	0.001	Aug 26	0.001	Jul 4	0.001
Third High:	Jan 25	0.001	Sep 7	0.001	Jul 2	0.001
Fourth High:	Jan 23	0.001	Sep 10	0.001	Jan 9	0.001
Annual Average:		0.000		0.000		*
Year Coverage:		96		83		67

Notes:

Hourly sulfur dioxide measurements and related statistics are available at Sacramento-Del Paso Manor between 1980 and 2012. Some years in this range may not be represented.

All averages expressed in parts per million.

An exceedance of a standard is not necessarily related to a violation of the standard.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

California Environmental Protection Agency
Air Resources Board

Top 4 Summary: Highest 4 Daily 24-Hour PM2.5 Averages

at Sacramento-T Street

	2012		2013		2014	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
National:						
First High:	Jan 10	27.1	Dec 30	39.2	Jan 17	26.3
Second High:	Jan 1	26.7	Dec 24	35.9	Dec 10	24.7
Third High:	Jan 19	20.5	Jan 17	33.4	Jan 8	24.1
Fourth High:	Jan 4	20.4	Jan 16	33.0	Jan 14	23.4
California:						
First High:	Jan 9	40.8	Dec 16	40.2	Jan 1	33.2
Second High:	Nov 16	31.1	Dec 30	39.4	Jan 16	32.5
Third High:	Jan 3	29.0	Dec 22	39.0	Jan 15	28.9
Fourth High:	Jan 10	27.1	Dec 24	35.9	Jan 17	27.5
National:						
Estimated # Days > 24-Hour Std:		0.0		6.1		0.0
Measured # Days > 24-Hour Std:		0		2		0
24-Hour Standard Design Value:		31		33		26
24-Hour Standard 98th Percentile:		20.5		33.4		24.1
Annual Standard Design Value:		8.8		9.5		8.8
Annual Average:		8.3		10.0		8.0
California:						
Annual Std Designation Value:		10		10		10
Annual Average:		*		10.1		8.1
Year Coverage:		94		93		98

Notes:

Daily PM2.5 averages and related statistics are available at Sacramento-T Street between 1998 and 2014. Some years in this range may not be represented.
All averages expressed in micrograms per cubic meter.
An exceedance of a standard is not necessarily related to a violation of the standard.
State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

California Environmental Protection Agency
Air Resources Board

Top 4 Summary: Highest 4 Daily 24-Hour PM2.5 Averages

at Sacramento-T Street

	2011		2012		2013	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
National:						
First High:	Dec 29	50.5	Jan 10	27.1	Dec 30	39.2
Second High:	Dec 20	47.8	Jan 1	26.7	Dec 24	35.9
Third High:	Dec 26	45.1	Jan 19	20.5	Jan 17	33.4
Fourth High:	Dec 8	36.3	Jan 4	20.4	Jan 16	33.0
California:						
First High:	Dec 29	50.5	Jan 9	40.8	Dec 16	40.2
Second High:	Dec 20	47.8	Nov 16	31.1	Dec 30	39.4
Third High:	Dec 26	45.1	Jan 3	29.0	Dec 22	39.0
Fourth High:	Dec 24	42.9	Jan 10	27.1	Dec 24	35.9
National:						
Estimated # Days > 24-Hour Std:		18.4		0.0		6.1
Measured # Days > 24-Hour Std:		6		0		2
24-Hour Standard Design Value:		33		31		33
24-Hour Standard 98th Percentile:		45.1		20.5		33.4
Annual Standard Design Value:		9.2		8.8		9.5
Annual Average:		10.1		8.3		10.0
California:						
Annual Std Designation Value:		10		10		10
Annual Average:		10.1		*		10.1
Year Coverage:		100		94		93

Notes:

Daily PM2.5 averages and related statistics are available at Sacramento-T Street between 1998 and 2014. Some years in this range may not be represented.
All averages expressed in micrograms per cubic meter.
An exceedance of a standard is not necessarily related to a violation of the standard.
State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

California Environmental Protection Agency
Air Resources Board

Top 4 Summary: Highest 4 Daily 24-Hour PM10 Averages

at Sacramento-T Street

	2011		2012		2013	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
National:						
First High:	Dec 23	38.8	Oct 18	36.2	May 4	53.1
Second High:	Oct 30	38.1	Nov 5	33.6	Feb 15	45.4
Third High:	Jan 21	37.1	Jan 16	33.0	Jan 16	42.9
Fourth High:	Dec 17	34.7	Aug 13	31.8	Jan 22	33.8
California:						
First High:	Dec 23	42.2	Oct 18	36.7	Nov 3	92.3
Second High:	Jan 21	39.3	Jan 16	35.6	May 1	66.8
Third High:	Oct 30	39.3	Nov 5	34.7	Oct 3	64.7
Fourth High:	Dec 17	37.1	Jan 4	33.7	Nov 7	64.1
National:						
Estimated # Days > 24-Hour Std:		0.0		0.0		*
Measured # Days > 24-Hour Std:		0		0		0
3-Yr Avg Est # Days > 24-Hr Std:		0.0		0.0		*
Annual Average:		*18.4*		*17.2*		*14.4*
3-Year Average:		*18*		*18*		*17*
California:						
Estimated # Days > 24-Hour Std:		0.0		0.0		*
Measured # Days > 24-Hour Std:		0		0		21
Annual Average:		19.2		17.8		*
3-Year Maximum Annual Average:		20		19		19
Year Coverage:		98		100		24

Notes:

Daily PM10 averages and related statistics are available at Sacramento-T Street between 1990 and 2014. Some years in this range may not be represented.

All averages expressed in micrograms per cubic meter.

The national annual average PM10 standard was revoked in December 2006 and is no longer in effect. Statistics related to the revoked standard are shown in *italics* or *italics* .

An exceedance of a standard is not necessarily related to a violation of the standard.

All values listed above represent midnight-to-midnight 24-hour averages and may be related to an exceptional event.

State and national statistics may differ for the following reasons:

- State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers.
- State statistics for 1998 and later are based on local conditions (except for sites in the South Coast Air Basin, where State statistics for 2002 and later are based on local conditions). National statistics are based on standard conditions.
- State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

Measurements are usually collected every six days. Measured days counts the days that a measurement was greater than the level of the standard; Estimated days mathematically estimates how many days concentrations would have been greater than the level of the standard had each day been monitored.

3-Year statistics represent the listed year and the 2 years before the listed year.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

California Environmental Protection Agency
Air Resources Board

Top 4 Summary: Highest 4 Daily 24-Hour PM10 Averages

at Sacramento-T Street

	2012		2013		2014	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
National:						
First High:	Oct 18	36.2	May 4	53.1	Oct 12	105.7
Second High:	Nov 5	33.6	Feb 15	45.4	Jan 24	83.5
Third High:	Jan 16	33.0	Jan 16	42.9	Jan 16	53.8
Fourth High:	Aug 13	31.8	Jan 22	33.8	Jan 15	52.2
California:						
First High:	Oct 18	36.7	Nov 3	92.3	Oct 12	106.4
Second High:	Jan 16	35.6	May 1	66.8	Jan 24	86.4
Third High:	Nov 5	34.7	Oct 3	64.7	Jan 16	56.4
Fourth High:	Jan 4	33.7	Nov 7	64.1	Jan 15	54.8

	2012	2013	2014
National:			
Estimated # Days > 24-Hour Std:	0.0	*	0.0
Measured # Days > 24-Hour Std:	0	0	0
3-Yr Avg Est # Days > 24-Hr Std:	0.0	*	*
Annual Average:	*17.2*	*14.4*	*21.6*
3-Year Average:	*18*	*17*	*
California:			
Estimated # Days > 24-Hour Std:	0.0	*	*
Measured # Days > 24-Hour Std:	0	21	4
Annual Average:	17.8	*	*
3-Year Maximum Annual Average:	19	19	*
Year Coverage:	100	24	0

Notes:

Daily PM10 averages and related statistics are available at Sacramento-T Street between 1990 and 2014. Some years in this range may not be represented.

All averages expressed in micrograms per cubic meter.

The national annual average PM10 standard was revoked in December 2006 and is no longer in effect. Statistics related to the revoked standard are shown in *italics* or *italics* .

An exceedance of a standard is not necessarily related to a violation of the standard.

All values listed above represent midnight-to-midnight 24-hour averages and may be related to an exceptional event.

State and national statistics may differ for the following reasons:

State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers.

State statistics for 1998 and later are based on local conditions (except for sites in the South Coast Air Basin, where State statistics for 2002 and later are based on local conditions). National statistics are based on standard conditions.

State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

Measurements are usually collected every six days. Measured days counts the days that a measurement was greater than the level of the standard; Estimated days mathematically estimates how many days concentrations would have been greater than the level of the standard had each day been monitored.

3-Year statistics represent the listed year and the 2 years before the listed year.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

California Environmental Protection Agency
Air Resources Board

Top 4 Summary: Highest 4 Daily Maximum Hourly Ozone Measurements

at Sacramento-T Street

	2011		2012		2013	
	Date	Measurement	Date	Measurement	Date	Measurement
First High:	Jun 21	0.100	Jul 12	0.104	Aug 19	0.091
Second High:	Aug 28	0.086	Aug 13	0.091	Jul 30	0.078
Third High:	Jul 5	0.083	Jul 10	0.086	Jul 3	0.077
Fourth High:	Aug 23	0.083	Aug 9	0.086	May 11	0.076
California:						
# Days Above the Standard:		1		1		0
California Designation Value:		0.09		0.09		0.09
Expected Peak Day Concentration:		0.092		0.091		0.091
National:						
# Days Above the Standard:		*0*		*0*		*0*
Nat'l Standard Design Value:		*0.095*		*0.091*		*0.091*
Year Coverage:		96		93		96

Notes:

Hourly ozone measurements and related statistics are available at Sacramento-T Street between 1989 and 2014. Some years in this range may not be represented.
All concentrations expressed in parts per million.
The national 1-hour ozone standard was revoked in June 2005 and is no longer in effect. Statistics related to the revoked standard are shown in *italics* or *italics* .
An exceedance of a standard is not necessarily related to a violation of the standard.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

California Environmental Protection Agency
Air Resources Board

Top 4 Summary: Highest 4 Daily Maximum Hourly Ozone Measurements

at Sacramento-T Street

	2012		2013		2014	
	Date	Measurement	Date	Measurement	Date	Measurement
First High:	Jul 12	0.104	Aug 19	0.091	Jul 14	0.085
Second High:	Aug 13	0.091	Jul 30	0.078	Sep 11	0.085
Third High:	Jul 10	0.086	Jul 3	0.077	Oct 6	0.084
Fourth High:	Aug 9	0.086	May 11	0.076	Jun 30	0.082
California:						
# Days Above the Standard:		1		0		0
California Designation Value:		0.09		0.09		0.09
Expected Peak Day Concentration:		0.091		0.091		0.091
National:						
# Days Above the Standard:		*0*		*0*		*0*
Nat'l Standard Design Value:		*0.091*		*0.091*		*0.086*
Year Coverage:		93		96		99

Notes:

Hourly ozone measurements and related statistics are available at Sacramento-T Street between 1989 and 2014. Some years in this range may not be represented.
All concentrations expressed in parts per million.
The national 1-hour ozone standard was revoked in June 2005 and is no longer in effect. Statistics related to the revoked standard are shown in *italics* or *italics* .
An exceedance of a standard is not necessarily related to a violation of the standard.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

California Environmental Protection Agency
Air Resources Board

Top 4 Summary: Highest 4 Daily Maximum Hourly Nitrogen Dioxide Measurements

at Sacramento-T Street

	2012		2013		2014	
	Date	Measurement	Date	Measurement	Date	Measurement
National:						
First High:	Oct 2	62.0	Sep 19	59.3	Oct 6	64.7
Second High:	Aug 29	56.0	Oct 18	56.4	Nov 6	61.4
Third High:	Oct 1	56.0	Nov 7	55.9	Sep 11	60.0
Fourth High:	Mar 8	55.0	Nov 8	53.8	Jan 28	56.3
California:						
First High:	Oct 2	62	Sep 19	59	Oct 6	64
Second High:	Aug 29	56	Oct 18	56	Nov 6	61
Third High:	Oct 1	56	Nov 7	55	Sep 11	60
Fourth High:	Mar 8	55	Oct 21	53	Jan 28	56
National:						
1-Hour Standard Design Value:		51		51		53
1-Hour Standard 98th Percentile:		51.0		52.2		54.7
# Days Above the Standard:		0		0		0
Annual Standard Design Value:		12		13		11
California:						
1-Hour Std Designation Value:		60		60		60
Expected Peak Day Concentration:		61		60		64
# Days Above the Standard:		0		0		0
Annual Std Designation Value:		13		13		12
Annual Average:		12		12		11
Year Coverage:		95		98		90

Notes:

Hourly nitrogen dioxide measurements and related statistics are available at Sacramento-T Street between 1989 and 2014. Some years in this range may not be represented.
All concentrations expressed in parts per billion.
An exceedance of a standard is not necessarily related to a violation of the standard.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

California Environmental Protection Agency
Air Resources Board

Top 4 Summary: Highest 4 Daily Maximum Hourly Nitrogen Dioxide Measurements

at Sacramento-T Street

	2011		2012		2013	
	Date	Measurement	Date	Measurement	Date	Measurement
National:						
First High:	Sep 28	57.0	Oct 2	62.0	Sep 19	59.3
Second High:	May 4	53.0	Aug 29	56.0	Oct 18	56.4
Third High:	Sep 1	51.0	Oct 1	56.0	Nov 7	55.9
Fourth High:	Sep 19	50.0	Mar 8	55.0	Nov 8	53.8
California:						
First High:	Sep 28	57	Oct 2	62	Sep 19	59
Second High:	May 4	53	Aug 29	56	Oct 18	56
Third High:	Sep 1	51	Oct 1	56	Nov 7	55
Fourth High:	Sep 19	50	Mar 8	55	Oct 21	53
National:						
1-Hour Standard Design Value:		51		51		51
1-Hour Standard 98th Percentile:		50.0		51.0		52.2
# Days Above the Standard:		0		0		0
Annual Standard Design Value:		13		12		13
California:						
1-Hour Std Designation Value:		60		60		60
Expected Peak Day Concentration:		62		61		60
# Days Above the Standard:		0		0		0
Annual Std Designation Value:		13		13		13
Annual Average:		13		12		12
Year Coverage:		96		95		98

Notes:

Hourly nitrogen dioxide measurements and related statistics are available at Sacramento-T Street between 1989 and 2014. Some years in this range may not be represented.
All concentrations expressed in parts per billion.
An exceedance of a standard is not necessarily related to a violation of the standard.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

California Environmental Protection Agency
Air Resources Board

Top 4 Summary: Highest 4 Daily Maximum State 24-Hour Sulfur Dioxide Averages

at Sacramento-Del Paso Manor

	2012		2013		2014	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
First High:	Aug 14	0.002	Apr 22	0.002		*
Second High:	Jul 4	0.001	May 11	0.002		*
Third High:	Jul 2	0.001	Apr 28	0.001		*
Fourth High:	Jan 9	0.001	Apr 27	0.001		*
Annual Average:		*		*		*
Year Coverage:		67		*		*

Notes:

Hourly sulfur dioxide measurements and related statistics are available at Sacramento-Del Paso Manor between 1980 and 2012. Some years in this range may not be represented.

All averages expressed in parts per million.

An exceedance of a standard is not necessarily related to a violation of the standard.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

California Environmental Protection Agency
Air Resources Board

Top 4 Summary: Highest 4 Daily Maximum 8-Hour Ozone Averages

at Sacramento-T Street

	2012		2013		2014	
	Date	8-Hr Average	Date	8-Hr Average	Date	8-Hr Average
National:						
First High:	Jul 12	0.092	May 3	0.068	Jul 6	0.072
Second High:	Aug 13	0.079	Aug 19	0.067	Jun 30	0.071
Third High:	Jul 10	0.077	Jul 3	0.066	Sep 11	0.071
Fourth High:	Jul 11	0.076	May 11	0.063	Jun 1	0.070
California:						
First High:	Jul 12	0.093	May 3	0.068	Jul 6	0.072
Second High:	Aug 13	0.080	Aug 19	0.068	Jun 30	0.071
Third High:	Jul 10	0.078	Jul 3	0.067	Jul 14	0.071
Fourth High:	Jul 11	0.077	May 11	0.064	Sep 11	0.071
National:						
# Days Above the Standard:		4		0		0
Nat'l Standard Design Value:		0.071		0.070		0.069
National Year Coverage:		92		96		97
California:						
# Days Above the Standard:		9		0		4
California Designation Value:		0.080		0.080		0.080
Expected Peak Day Concentration:		0.081		0.081		0.080
California Year Coverage:		90		95		97

Notes:

Eight-hour ozone averages and related statistics are available at Sacramento-T Street between 1989 and 2014. Some years in this range may not be represented.
All averages expressed in parts per million.
An exceedance of a standard is not necessarily related to a violation of the standard.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide

California Environmental Protection Agency
Air Resources Board

Top 4 Summary: Highest 4 Daily Maximum 8-Hour Ozone Averages

at Sacramento-T Street

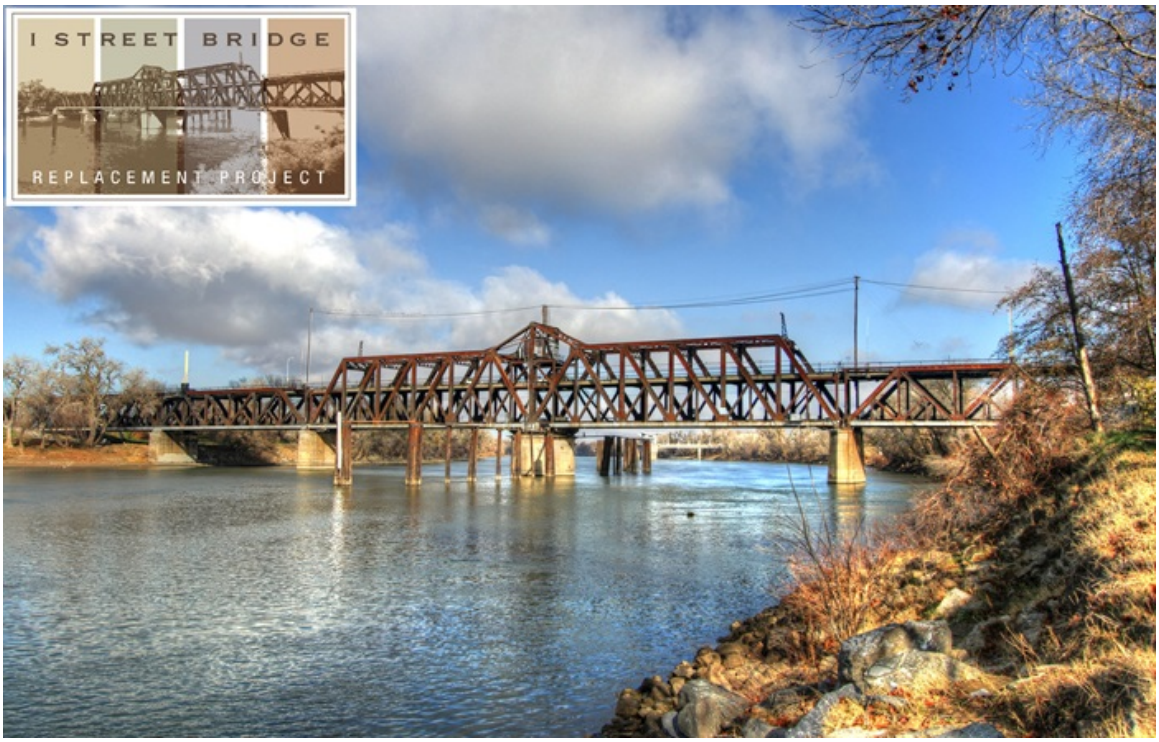
	2011		2012		2013	
	Date	8-Hr Average	Date	8-Hr Average	Date	8-Hr Average
National:						
First High:	Jun 21	0.087	Jul 12	0.092	May 3	0.068
Second High:	Jul 2	0.072	Aug 13	0.079	Aug 19	0.067
Third High:	Aug 23	0.072	Jul 10	0.077	Jul 3	0.066
Fourth High:	Jul 5	0.071	Jul 11	0.076	May 11	0.063
California:						
First High:	Jun 21	0.087	Jul 12	0.093	May 3	0.068
Second High:	Jul 2	0.073	Aug 13	0.080	Aug 19	0.068
Third High:	Aug 23	0.072	Jul 10	0.078	Jul 3	0.067
Fourth High:	Aug 28	0.072	Jul 11	0.077	May 11	0.064
National:						
# Days Above the Standard:		1		4		0
Nat'l Standard Design Value:		0.071		0.071		0.070
National Year Coverage:		96		92		96
California:						
# Days Above the Standard:		5		9		0
California Designation Value:		0.080		0.080		0.080
Expected Peak Day Concentration:		0.084		0.081		0.081
California Year Coverage:		96		90		95

Notes:

Eight-hour ozone averages and related statistics are available at Sacramento-T Street between 1989 and 2014. Some years in this range may not be represented.
All averages expressed in parts per million.
An exceedance of a standard is not necessarily related to a violation of the standard.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* means there was insufficient data available to determine the value.

Available Pollutants:

8-Hour Ozone | Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | State Sulfur Dioxide | Hydrogen Sulfide



Community Impact Assessment

I Street Bridge Replacement Project

Sacramento and Yolo Counties

Federal Project No.: BRLS 5002(164)

August 2016

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Community Impact Assessment

I Street Bridge Replacement Project
Sacramento and Yolo Counties
Federal Project No.: BRLS 5002(164)

August 2016

Prepared By: Lindsay Christensen Date: August 3, 2016

Lindsay Christensen
Environmental Planner
ICF International, Sacramento

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List of Acronyms and Abbreviations

AAGR	Average Annual Growth Rate
AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
BMPs	best management practices
BPTMP	Bicycle, Pedestrian, and Trails Master Plan
Caltrans	California Department of Transportation
CEQ	President's Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CIA	community impact assessment
CIDH	cast-in-drill-hole
CVFPB	Central Valley Flood Protection Board
EIR	environmental impact report
FHWA	Federal Highway Administration
HBP	Highway Bridge Program
I-5	Interstate-5
LID	low impact development
Metro Fire	Sacramento Metropolitan Fire District
MTP/SCS	Metropolitan Transportation Plan/Sustainable Communities Strategy
NEPA	National Environmental Policy Act
PG&E	Pacific Gas and Electric Company
project	Interchange Improvements Project
RSP	rock slope protection
SACOG	Sacramento Area Council of Governments
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMUD	Sacramento Municipal Utilities District
TMP	Traffic Management Plan
USC	United States Code
USCG	U.S. Coast Guard
YSAQMD	Yolo-Solano Air Quality Management District

Chapter 1 Proposed Project

1.1 Purpose of a Community Impact Assessment

The purpose of a community impact assessment (CIA) is to consider how a project would affect the people, businesses, neighborhoods, communities, and social and economic characteristics of an area. This CIA serves as one of the background technical reports that will be used to prepare relevant sections of the environmental document for the proposed project.

A CIA is "a process to evaluate the effects of a transportation action on a community and its quality of life" (Federal Highway Administration 1996). It describes the relevant existing conditions within an area; potential impacts of the project on the community and its neighborhoods; and potential measures to best avoid, minimize, or compensate for any adverse community impacts of a proposed project.

This document has been prepared to provide the California Department of Transportation (Caltrans), the Cities of Sacramento and West Sacramento, and the public with information about the socioeconomic and community-level effects of construction and operation of the I Street bridge Replacement Project (project).

This report identifies impacts associated with land use changes, social effects, property acquisitions, and economic changes; it also addresses environmental justice issues. The report was prepared according to the *Community Impact Assessment, Caltrans Standard Environmental Reference, Environmental Handbook 4* (California Department of Transportation 2011), which contains Caltrans guidelines for preparing socioeconomic assessments and Federal Highway Administration (FHWA) guidelines.

1.2 Introduction

The City of Sacramento, in cooperation with the City of West Sacramento and Caltrans, proposes to construct a new bridge over the Sacramento River to replace the vehicle crossing that is currently accommodated by the existing I Street Bridge in order to remove a series of functionally obsolete or structurally deficient bridges (i.e., approach structures). The new connection also would reduce future traffic congestion, improve operations and safety, serve multiple modes of transportation, and comply with current American Association of State Highway and Transportation Officials (AASHTO), Caltrans, and local agency design standards.

The project is subject to state and federal environmental review requirements because of use of federal Highway Bridge Program (HBP) funds from the FHWA. Accordingly, project documentation is being prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The City of Sacramento is the lead agency under CEQA, with the City of West Sacramento as a responsible agency, and Caltrans is the lead agency under NEPA. The FHWA's other responsibilities for environmental review, consultation, and any other action required in accordance with applicable federal laws

for this project will be carried out by Caltrans under its assumption of responsibility pursuant to 23 United States Code (USC) 327.

This project is included in the Sacramento Area Council of Governments (SACOG) 2035 *Metropolitan Transportation Plan/Sustainable Communities Strategy* (MTP/SCS).

1.2.1 Project Location

The proposed project is located over the Sacramento River between the cities of Sacramento and West Sacramento, approximately 1,000 feet north of the existing I Street Bridge (Figure 1-1). The project limits starting within the City of Sacramento consist of Railyards Boulevard from 200 feet east of Bercut Drive on the east, continuing west over the Sacramento River into the City of West Sacramento along C Street, and terminating approximately 100 feet west of the 5th Street intersection. The project limits also extend along Bercut Drive approximately 500 feet north of Railyards Boulevard, along Jibboom Street 550 feet north of Railyards Boulevard and 300 feet south of Railyards Boulevard, along 3rd Street 50 feet north and south of C Street, along 4th Street 50 feet north and south of C Street, and along 5th Street 50 feet north and south of C Street. The total length of the project is approximately 0.42 mile along C Street and Railyards Boulevard.

1.3 Purpose and Need

The proposed project would construct a new bridge over the Sacramento River between the Cities of Sacramento and West Sacramento to replace the vehicle crossing that is currently provided by the existing I Street Bridge. Construction of the proposed project has independent utility; the project is not dependent on other projects or improvements to meet the purpose and need.

Termini for the proposed project were developed through an iterative process involving engineering design and traffic operations analysis. Preliminary design concepts were tested with the traffic operations analysis model to evaluate how lane configurations influenced peak-hour conditions.

1.3.1 Purpose

The purpose and objectives of the project are listed below.

- The project should construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge from C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento, consistent with the adopted findings of the Sacramento River Crossings Alternatives Study for Bridge Location 2 in the North Market Area.

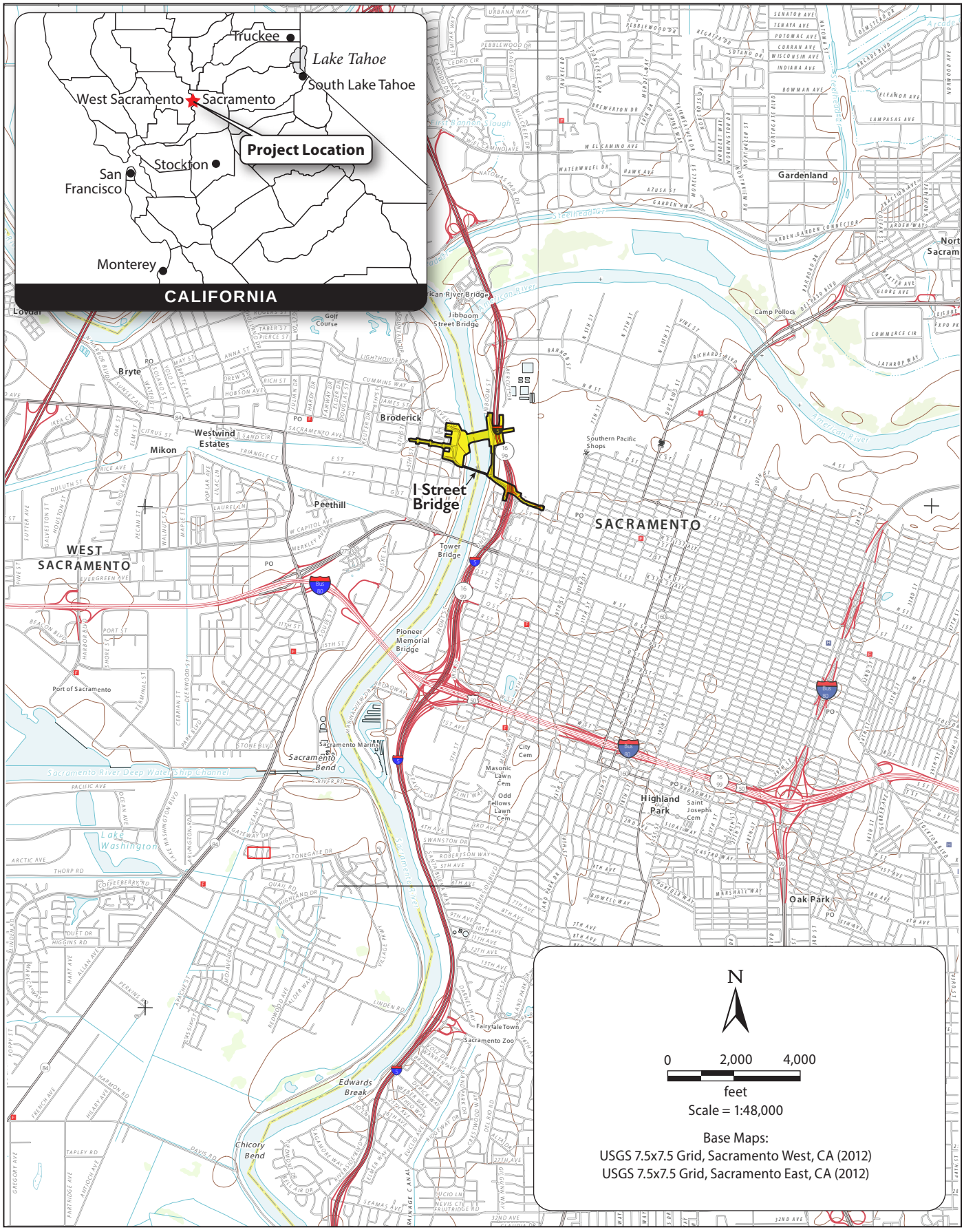

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Figure 1-1
Vicinity Map

- The new bridge should meet the requirements of the Neighborhood Friendly Bridge definition that the City of Sacramento City Council adopted by resolution on October 18, 2011, which is defined by the following elements.
  - A facility whose primary function is local connectivity rather than regional travel and primarily serves short local trips.
  - A bridge which serves all users, including motorists, bicyclists, pedestrians, low energy vehicles, and public transit riders.
  - A bridge with aesthetics and dimensions which are architecturally pleasing and contextually appropriate for the adjacent neighborhoods.
  - A bridge that does not exceed or expand the already-planned capacity of the approach roadways (i.e., no widening of approaches just to accommodate bridge flows).
  - A facility which is designed with a target speed equal to or less than the approach roadways.
  - A bridge which reduces the growth in vehicle miles traveled in the adjacent communities.
  - A bridge that does not connect directly to streets which are primarily residential in character.
  - A bridge that is consistent with the Need and Purpose statement [the adopted Sacramento River Crossings Alternatives Study statement] as articulated.
- In addition to the Neighborhood Friendly Bridge definition, the project should include pedestrian and bicycle facilities in the new public crossing that meet Americans with Disabilities Act (ADA) requirements, and facilitate connections to and from the new crossing and the Sacramento River Parkway and Riverfront Park trails.
- The proposed project also would need to construct a movable bridge that satisfies the vertical clearance and river navigation requirements of the U.S. Coast Guard (USCG).
- The project design should not preclude future addition of a streetcar, a separate, stand-alone project being developed by the Cities of West Sacramento and Sacramento.
- The new bridge also is intended to improve the connectivity to, and accessibility of, businesses, recreational areas, and new or redevelopment opportunity sites located in the urban core of Sacramento and West Sacramento.

1.3.2 Need

The project is needed for the following reasons.

- The existing I Street Bridge does not fully comply with current design and traffic operation standards due to the following conditions.
  - I Street Bridge limits or restricts traffic capacity and multimodal use. The current bridge width is not sufficient to provide adequate traffic operations, bicycle lanes, or the ability for transit service across the bridge.

  - The I Street Bridge and the four associated approach structures are on the federal eligible bridge list for federal funds for replacement and/or rehabilitation through the HBP. The I Street Bridge has been classified as functionally obsolete, and the existing approach structures have been classified as structurally deficient. The Cities of Sacramento and West Sacramento have decided to pursue replacement through the HBP.

- As adopted by the Sacramento City Council, new crossings of the Sacramento River between the City of Sacramento and City of West Sacramento shall be Neighborhood Friendly. In coordination with staff from the City of West Sacramento and SACOG, the definition for a Neighborhood Friendly Bridge was developed by the City of Sacramento and the Sacramento City Council adopted the definition by resolution in October 2011. The replacement bridge structure is required to be consistent with the Neighborhood Friendly Bridge definition.
- In addition to the Neighborhood Friendly Bridge requirements, lack of ADA compliance, non-standard and non-continuous sidewalks, and lack of bicycle facilities discourage walking and bicycling on the existing I Street Bridge.
- Section 9 of the Rivers and Harbors Act requires any local, state, or federal agency planning to construct a bridge over a navigable waterway to apply for a bridge permit through the USCG. The USCG requires the new bridge to meet or exceed the existing vertical clearance along the river, which is currently set by the US 50 Pioneer Bridge. In order to comply with the Neighborhood Friendly Bridge definition and meet the USCG requirements for navigation clearance, the new bridge will need to be movable.
- The SACOG MTP/SCS identifies that a proposed streetcar will cross over the new bridge from Sacramento to West Sacramento. While the streetcar will be a separate, stand-alone project, the bridge design must not preclude the future addition of a streetcar.
- Limited connectivity to the riverfront reduces the potential to achieve planned urban development and redevelopment of opportunity sites identified in the adopted plans of Sacramento and West Sacramento.

1.4 Project Description

This section describes the proposed action and the design alternatives that were developed to meet the identified need through accomplishing the defined purpose(s), while avoiding or minimizing environmental impacts. The alternatives under consideration are one bridge alignment for the new bridge over the Sacramento River and two alternatives for portions of the roadway design in Sacramento and in West Sacramento.

- City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection
  - Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive
  - Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive

- City of West Sacramento Residential Access
  - Alternative 1—C Street Connection to B Street
  - Alternative 2—C Street Connection to 3rd Street
- No-Build (No-Project) Alternative

The proposed project is located in Sacramento and Yolo Counties, over the Sacramento River and between the Cities of Sacramento and West Sacramento, and approximately 1,000 feet north of the existing I Street Bridge (Figure 1-1). The total length of the project is approximately 0.42 mile along C Street and Railyards Boulevard. The purpose of the project is to construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge from C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento in order to remove a series of functionally obsolete or structurally deficient bridges, consistent with the adopted findings of the Sacramento River Crossings Alternatives Study for Bridge Location 2 in the North Market Area.

1.4.1 Build Alternatives

One alignment is proposed for the new bridge over the Sacramento River. A new approximately 860-foot bridge, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides, is proposed. The bridge would include two fixed-span approach structures, approximately 200 feet and 270 feet in length, that tie into the Sacramento and West Sacramento banks of the river, respectively. The center span of the bridge would be an approximately 330-foot movable span that meets the USCG requirements. Roadway improvements on Railyards Boulevard in Sacramento and C Street in West Sacramento also are proposed. In both Sacramento and West Sacramento, two alternatives for portions of the roadway design are being considered.

- City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection
  - Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive
  - Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive

In the City of Sacramento, Alternative 1 consists of a signalized intersection at Jibboom Street and Bercut Drive, while Alternative 2 consists of a roundabout between these two intersections. Beyond the Jibboom Street and Bercut Drive intersections, the remaining project elements and limits in the City of Sacramento are similar under both alternatives.

- City of West Sacramento Residential Access
  - Alternative 1—C Street Connection to B Street
  - Alternative 2—C Street Connection to 3rd Street

In the City of West Sacramento, the proposed C Street alignment would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. Two alternatives are proposed for maintaining access to these parcels. Alternative 1 would construct a

new connection to C Street, approximately 150 feet east of the C Street/3rd Street intersection, that would extend north to B Street and then ultimately connect to the 3rd Street/B Street intersection. Alternative 2 would connect to the same location at C Street as Alternative 1, approximately 150 feet east of the C Street/3rd Street intersection, but would continue north approximately 300 feet, then make a 90-degree left turn, and connect to 3rd Street approximately 300 feet north of C Street.

1.4.1.1 Common Design Features of the Build Alternatives

The proposed project would construct a new bridge over the Sacramento River between Sacramento and West Sacramento to replace the vehicular crossing that is provided by the existing I Street bridge. The project would facilitate vehicular and multimodal traffic over the river in order to reduce traffic congestion, improve safety, and remove a number of structurally deficient or functionally obsolete bridges that have reached the limit of their design life. While the existing I Street Bridge over the Sacramento River would remain in-place, the approach structures leading up to the bridge from both directions would be demolished. See Figure 1-2 for a depiction of the project limits and the approach structures that would be removed.

The Sacramento River is considered to be a navigable waterway of the United States. Under the provisions of the General Bridge Act of 1946, as amended, the USCG must approve proposed location and plans for bridges over navigable waters of the United States prior to commencing construction. In order to comply with the adopted Neighborhood Friendly Bridge definition and the USCG requirement to maintain navigation along the river, the new bridge is proposed to be a movable bridge.

Common design features of the build alternatives are listed below.

New Bridge Construction and Roadway Modifications

Bridge Construction

The proposed project would construct a new bridge over the Sacramento River. The total bridge length would be approximately 860 feet long, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides of the bridge. The bridge would include two fixed-span approach structures that tie into the Sacramento and West Sacramento banks of the river and are approximately 200 feet and 270 feet in length, respectively. The center span of the bridge would be a movable span that meets the USCG requirements. The movable span is anticipated to be approximately 330 feet in length. The bridge soffit elevation would be set 3 feet above the 200-year water surface elevation to comply with the Central Valley Flood Protection Board (CVFPB) freeboard requirements.

The two fixed-span approach structures would be 72 feet wide, with a superstructure depth (or total bridge thickness) of approximately 6 feet. Each approach structure would be a two-span bridge. The abutment at one end of the structure would be constructed on the banks of the river, a center pier would be placed within the river approximately around the existing bank toe of slope, and the other end of the approach structure would be constructed on the piers for the movable span.

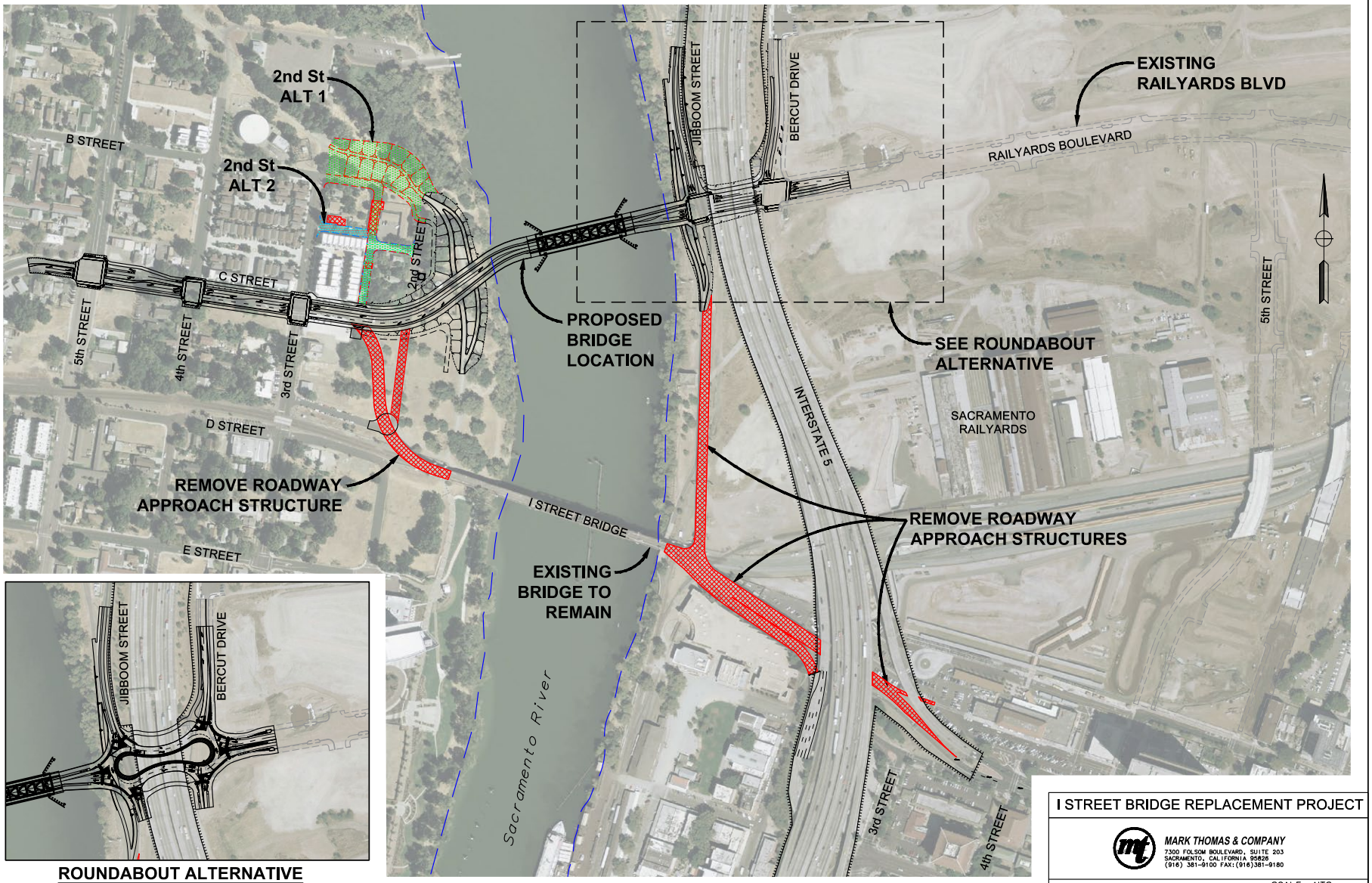

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Figure 1-2
Proposed Project

Based on coordination with the USCG, the movable span would provide a 278-foot clear channel opening approximately centered at the middle of the river. As such, the movable span has been identified as a vertical lift bridge, which would raise the bridge to a minimum vertical clearance of 59 feet over the maximum river elevation of 31 feet (measured to the NGVD 29 vertical datum). The truss depth of the movable span would be approximately 40 feet, with 6 feet of the structure being below the bridge deck and 34 feet above the bridge deck. The vertical towers would be approximately 130 feet tall, measured from the bridge soffit elevation. The vertical towers would be approximately 33 feet in thickness and the same width as the bridge deck. The total bridge width on the movable span would be 81 feet.

Due to the existing soil conditions, the bridge would be constructed on deep pile foundations. The abutments for the fixed-span approach structures at the river bank would consist of approximately 50 piles per abutment that are driven or cast-in-drill-hole (CIDH), to a depth of approximately 70 feet below the original ground elevation. The center piers for the two fixed-span approach structures (located approximately at the bank toe of slope in the river, below the ordinary high water mark) would consist of 50 driven or CIDH piles per pier that are approximately 70 feet below the original ground elevation. If driven piles are selected for either the abutments or piers, the piles would be precast concrete or steel. The foundations for the movable span would consist of four large-diameter cast-in-steel-shell piles per pier. Each pile would be 9 feet in diameter, extending approximately 140 feet below the original ground elevation.

Erosion control measures would be installed around the proposed bridge foundations to prevent future scour at the bridge supports. It is anticipated that rock slope protection (RSP) would be installed around the bridge abutments and piers within the water to control erosion.

A bridge fender system also is planned around the movable span piers to protect the piers from errant watercrafts that are navigating along the river. The fender system would include approximately 30 driven concrete or wooden piles around each of the movable span piers. The piles would be driven to a depth of approximately 30 feet below the original ground elevation.

Temporary Falsework

Temporary falsework platforms would be required to construct the proposed bridge foundations and approach structures. The platforms would be constructed using temporary piles within the river that would be installed on or after April 15; they would be removed by October 31 of each year, and following completion of construction. In addition, temporary cofferdams would be required to construct the bridge piers within the water. The cofferdams would consist of temporary sheetpiles installed around the individual piers. Dewatering inside the cofferdams would be required.

Roadway Modifications

City of Sacramento

In Sacramento, Bercut Drive would be modified from Railyards Boulevard north approximately 500 feet. Bercut Drive would be designed to have two northbound lanes at the Railyards

Boulevard intersection, tapering down to one northbound lane at the northern project limits, and one southbound lane. Improvements to Bercut Drive south of Railyards Boulevard are not part of, nor needed for, the proposed project and would be constructed if needed as part of a separate future project.

Proposed improvements on Jibboom Street would extend 550 feet north of Railyards Boulevard. The roadway would consist of one travel lane in each direction, on-street Class II bike lanes, sidewalk along the west side of the roadway, and retaining walls of various heights along both sides of the road. Extension of Jibboom Street south of Railyards Boulevard is not included with, nor needed for, the proposed project and would be constructed if needed as part of a separate future project.

The proposed roadway profile for Railyards Boulevard would be approximately 6 feet higher than the original ground elevation at the Jibboom Street intersection. The profile adjustment is needed in order to satisfy the CVFPB requirements to provide 3 feet of clearance between the 200-year-flood water surface elevation and the bridge soffit (or low chord of the bridge).

City of West Sacramento

Between the bridge touchdown location along C Street in West Sacramento and the 4th Street/ C Street intersection, the roadway would consist of one westbound travel lane, two eastbound travel lanes (the two eastbound travel lanes would taper down to one eastbound lane east of the 3rd Street intersection), a center left-turn lane, on-street Class II bike lanes, on-street parking along the north side of the roadway, and sidewalks along both sides of the roadway. As the roadway through this section currently consists of the proposed number of travel lanes, the widening through this area is primarily needed to support the Class II bike lanes and wider sidewalks.

Along C Street between 4th Street and 5th Street, the roadway would consist of one travel lane in each direction, left-turn lanes, on-street Class II bike lanes, and sidewalks along both sides of the road. All of the improvements through this section would be accommodated within the existing roadway limits.

Class I Bikeway and Levee Modifications and Improvements

City of Sacramento

The existing Class I Sacramento River Parkway along Jibboom Street would be reconstructed approximately 500 feet north and 300 feet south of Railyards Boulevard as part of the proposed project. In order to maintain a continuous off-street Class I path along this section, the path would be grade-separated under the proposed bridge structure. Cyclists and pedestrians approaching Railyards Boulevard in either direction would have the option to continue along the path under the new structure, avoiding the need to cross the roadway. Cyclists and pedestrians who are traveling along the path also would have the option to connect to Railyards Boulevard and cross over the proposed bridge into West Sacramento or turn east into Sacramento. Due to the limited horizontal clearance between the river and the Interstate-5 (I-5) viaduct structure, retaining walls would be needed along the path to account for the vertical elevation difference

between Jibboom Street and the path that continues under the proposed bridge structure. The maximum retaining wall height along the bike path would be 16 feet.

City of West Sacramento

The proposed project would require improvements to the existing levee along the West Sacramento side of the river, where the proposed bridge alignment would connect to C Street. The existing levee does not meet current standards required by Title 23 of the California Code of Regulations. Extending approximately 300 feet north and south of the proposed C Street alignment, the levee cross-section would be reconstructed to meet current design standards, which would require 3:1 side slopes on the landside and waterside of the levee, and a 20-foot-wide crown at the top of the levee. The levee improvements also would include a slurry cutoff wall extending to a depth of 110 feet below the original ground elevation. In addition, the proposed roadway profile would be approximately 6 feet higher than the original ground elevation as it crosses over the levee. In order to maintain access to the levee for inspection and maintenance services, access roads would be constructed from the new roadway to the top of the improved levee section. The proposed grading for the levee would require relocation of the existing water tower that is located along 2nd Street, just north of the proposed C Street alignment. The tower would be relocated to the northwest, approximately 43 feet from its existing location.

The new levee maintenance road also would serve as the future Class I River Walk Park trail extension in West Sacramento. Similar to the trail improvements proposed as part of the project in Sacramento, the trail would be grade-separated under the proposed bridge structure. Cyclists and pedestrians approaching C Street in either direction would have the option to continue along the trail under the new structure, avoiding the need to cross the roadway. Cyclists and pedestrians who are traveling along the trail also would have the option to connect to C Street to cross over the proposed bridge into Sacramento or head west on C Street.

Storm Water Drainage Management

Drainage for the proposed roadway would be conveyed to the existing storm drain system installed within Railyards Boulevard and C Street. Railyards Boulevard currently drains storm water to the east along the roadway and then into a retention basin south of Railyards Boulevard. C Street drains storm water west along the roadway and then ultimately south beyond the project limits.

As is standard with all construction projects, the contractor would be required to install temporary best management practices (BMPs) to control any runoff or erosion from the project site into the surrounding waterways. These temporary BMPs would be installed prior to any construction operations and would be in place for the duration of the contract. The removal of these BMPs would be the final operation, along with project site cleanup.

Structure Demolition and Roadway Modifications

Following completion of the new bridge connections at Railyards Boulevard and C Street, traffic would be diverted to the new bridge, and the four existing approach structures to the I Street

Bridge would be removed. Bridge numbers 24C0364L, 24C0364R, 22-0033, and 22C0154 would be demolished and the foundations would be removed to a depth of 3 feet below the original ground elevation. Encroachment permits from Caltrans and Union Pacific Railroad would be needed to complete the bridge removal. The existing I Street Bridge is owned and operated by Union Pacific Railroad and would continue to remain in-place and used by trains following construction of the new bridge.

As part of the removal of the existing approach structures, the project would include modifications to I Street within the City of Sacramento from the southbound I-5 on-ramp east to the 5th Street intersection. The modification would include signing and striping revisions, demolition of existing roadway sections that are no longer required, and removal of bridge abutments and foundations.

Staging, Storage, and Proposed Access during Construction

Two staging areas would be used to store materials and equipment during construction, such as pipe materials, precast manholes and drop inlets, steel girders, piles, and rebar, along with the construction equipment when not in use. One area would be located south of Railyards Boulevard under I-5 in Sacramento; the other area would be located west of the landward side of the levee, south of the new bridge location in West Sacramento. The staging area located along Railyards Boulevard would be accessed via the existing intersection at Jibboom Street. The staging area in West Sacramento would be accessed via the existing 2nd Street connection at 3rd Street, south of C Street. The staging areas would be in use throughout the construction duration; the areas would be returned to their pre-project conditions at the completion of the project.

Utility Relocations

A number of public and private utilities would need to be relocated or adjusted to grade as part of the project, including existing water, sewer, gas, electric, and communication facilities within Jibboom Street, Bercut Drive, C Street, and 2nd Street.

Traffic Management and Detours during Construction

While most of the project would be constructed outside of existing roadways, some areas would require temporary detours or staged construction.

Along Jibboom Street at the proposed Railyards Boulevard intersection, the new roadway profile would be raised approximately 6 feet above the original ground elevation. To maintain access to the existing Jibboom Street viaduct south of Railyards Boulevard during the roadway construction, a temporary access road would be needed. The proposed temporary access road would connect to the existing Jibboom Street viaduct abutment approximately 350 feet south of Railyards Boulevard. The temporary road would then continue under I-5 and connect to the Railyards Boulevard/Bercut Drive intersection. The temporary road would require placement of temporary fill material and a roadway structural section that would be removed after construction of the new bridge. Traffic traveling north along Jibboom Street would continue north along Bercut Drive to access the Richards Boulevard/I-5 interchange.

In order to complete the improvements at Jibboom Street and Railyards Boulevard, Jibboom Street would be closed to traffic approximately 600 feet north of Railyards Boulevard. Traffic traveling south along Jibboom Street to continue over the existing I Street Bridge into West Sacramento would be detoured over to Bercut Drive at Richards Boulevard. Traffic would then use the temporary access road to connect to the Jibboom Street viaduct structure. The temporary access road would be in place for approximately 2 years, after which traffic would use the new roadways and new bridge.

The Sacramento River Parkway trail along Jibboom Street also would require temporary re-routing during construction. The temporary alignment for the trail would follow the temporary Jibboom Street alignment south of Railyards Boulevard. Cyclists and pedestrians would then continue following a detour north along Bercut Drive to Richards Boulevard, where they could then connect back to the Parkway on the west side of I-5. The detour would be in place for approximately 2 years.

During construction, traffic along C Street would be maintained along the existing approach structure until the new bridge is constructed.

Project Construction Sequence

New bridge and roadway construction would occur first, followed by demolition of the four approach structures that connect to the existing I Street Bridge. Once the new bridge and roadways are constructed, traffic would be diverted to the new bridge in order to allow demolition adjacent to the existing bridge. Construction of the project is expected to take approximately 30 months.

Property Acquisition

The project would require temporary and permanent property acquisitions along C Street, 3rd Street, and 2nd Street within the City of West Sacramento and along Railyards Boulevard, Jibboom Street, Bercut Drive, and I Street within the City of Sacramento.

Along C Street, temporary and permanent acquisitions would be required along the south side of the roadway to accommodate the construction of standard shoulders, bike lanes, and sidewalks—from the intersection of 4th Street to the Sacramento River.

Along 3rd Street and 2nd Street, temporary and permanent acquisitions would be needed from the Union Pacific Railroad on the south, to just north of the B Street intersections, for construction of the proposed roadway and levee improvements.

Along Railyards Boulevard, Jibboom Street, and Bercut Drive, temporary and permanent acquisition would be needed from the current state-owned right-of-way for I-5, for construction of the roadway. In addition, temporary and permanent acquisitions would be needed along Jibboom Street for the proposed temporary detour road and Class I bikeway improvements.

Temporary acquisition would be required along the existing I Street connection to facilitate removal of the existing viaduct structures. Due to the limited space available in Old Sacramento,

it is anticipated that construction activities would occur from the parking lot at the intermodal station.

1.4.1.2 Unique Features of Build Alternatives

In both the City of Sacramento and the City of West Sacramento, two alternatives for portions of the roadway design are being considered.

City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection

Alternative 1 consists of a signalized intersection at Jibboom Street and Bercut Drive, while Alternative 2 consists of a roundabout between these two intersections. Beyond the Jibboom Street and Bercut Drive intersections, the remaining project elements and limits are similar under both alternatives.

Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive

Under Alternative 1, Railyards Boulevard would be extended west over the Sacramento River; east of Bercut Drive. Railyards Boulevard would consist of two westbound lanes and one eastbound lane. Between Jibboom Street and Bercut Drive, Railyards Boulevard would consist of two westbound lanes and three eastbound lanes; two eastbound lanes would be trapped into left-turn lanes onto Bercut Drive, and one eastbound lane would continue along Railyards Boulevard. West of the Jibboom Street intersection, Railyards Boulevard would consist of one lane in each direction.

Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive

Under Alternative 2, Railyards Boulevard would be extended west over the Sacramento River. East of Bercut Drive, Railyards Boulevard would consist of two westbound lanes and one eastbound lane. Between Jibboom Street and Bercut Drive, Railyards Boulevard would consist of a roundabout with two lanes in each direction. One westbound lane would be a trap onto northbound Jibboom Street, and one westbound lane would continue onto the new bridge. One eastbound lane would be trapped into left-turn lanes onto Bercut Drive, and one eastbound lane would continue along Railyards Boulevard. West of Jibboom Street, Railyards Boulevard would consist of one lane in each direction.

City of West Sacramento Residential Access

The new C Street alignment would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. Two alternatives are proposed for maintaining access to these parcels.

Alternative 1—C Street Connection to B Street

Alternative 1 would construct a new connection to C Street approximately 150 feet east of the 3rd Street intersection. The new access road would be 30 feet wide, extend north to B Street, and then ultimately connect to the 3rd Street/B Street intersection. This alternative would require

right-of-way acquisitions from six individual parcels and removal of two structures. One structure is located on APN 010-101-010 and appears to be an individual residence. Another structure is located on APN 010-101-013 and appears to be an apartment building that supports up to four individual apartments. As B Street currently is constructed along the existing levee, the roadway improvements also would require an additional 500 feet of improvements to the levee. Similar to the improvements identified along C Street, the levee cross-section would be reconstructed to meet current design standards, which require 3:1 side slopes on the landside and waterside of the levee, with a 20-foot-wide crown at the top of the levee. The levee improvements also would include a slurry cutoff wall that extends to a depth of 110 feet below the original ground elevation.

Alternative 2—C Street Connection to 3rd Street

Alternative 2 would connect to the same location at C Street, approximately 150 feet east of the 3rd Street intersection and continue north approximately 300 feet. This alternative would then make a 90-degree left turn and connect to 3rd Street approximately 300 feet north of C Street. This alternative would require right-of-way acquisition from seven individual parcels and removal of three structures. One structure is located on APN 010-101-010 and appears to be an individual residence. Another structure is located on APN 010-101-013 and appears to be an apartment building that supports up to one individual apartment. The last structure is located on APN 010-101-004 and appears to be an individual residence.

1.4.2 No Build (No-Project) Alternative

Under the No Build Alternative, the existing I Street Bridge would remain in use for vehicle, bicycle, and pedestrian access between the Cities of Sacramento and West Sacramento. No changes to traffic patterns on I Street or C Street would occur. The four approach structures would remain in place and in use; and there would be no changes to existing roadways, levees or Class I bikeways.

Improvements and development of transportation infrastructure would continue following the General Plans of both cities, the Sacramento Railyards Specific Plan (approved December 2007), and the Washington Specific Plan (adopted May 1996). The Sacramento Railyards Specific Plan identifies the extension of Railyards Boulevard west to a Tee intersection at Jibboom Street. Railyards Boulevard at Bercut Drive would consist of two westbound lanes and one eastbound lane. The same number of lanes on Railyards Boulevard would extend west to the intersection with Jibboom Street; at this point, the left westbound lane on Railyards Boulevard would become a dedicated left-turn onto southbound Jibboom Street, and the right westbound lane would be a dedicated right-turn onto northbound Jibboom Street.

In West Sacramento, future changes to C Street would be based on the Washington Specific Plan, which identifies 12-foot-wide sidewalks and 7-foot-wide Class II bike lanes along the roadway. The connection to the I Street Bridge would not change.

Chapter 2 Affected Environment

This chapter discusses the existing economic and demographic character of the study area for the proposed project. As described in Chapter 1, "Introduction," the project area is located over the Sacramento River between the cities of Sacramento and West Sacramento, approximately 1,000 feet north of the existing I Street Bridge (Figures 1-1 and 1-2). For the purposes of this analysis, the study area is considered to be within the U.S. Census Bureau–designated block groups that intersect the project area. Figure 2-1 depicts the CIA study area and shows the individual block groups: CT 101.01 BG 1, CT 101.01 BG 3, CT 101.01 BG 4, CT 07.00 BG 1, and CT 53.01 BG 1.

2.1 Land Use

The project area traverses portions of two counties (Sacramento and Yolo) and two cities (Sacramento and West Sacramento). Overall, the project area is densely developed and is surrounded by commercial, industrial, and residential development.

The portion of the study area east of the Sacramento River and north of the existing I Street Bridge (CT 53.01 BG 1), contains land uses that are primarily industrial and commercial. It is largely made up of the Sacramento Railyards, including the Sacramento Valley/Amtrak station. The Sacramento water treatment plant is located just east of I-5, adjacent to the Railyards, along Bercut Drive. Matsui Waterfront Park, the Sacramento River Parkway and several hotels are located along the Sacramento Riverfront. The American River, Tiscornia Park, and the American River Parkway border this portion of the study area to the north.

The portion of the study area east of the Sacramento River and south of the existing I-Street bridge (CT 07.00 BG 1) is bisected by I-5. Old Sacramento, the City's historic district, is located between the Sacramento River and I-5. The historic district is primarily made up of commercial and recreational uses. The area east of I-5 is made up of commercial uses, including retail, office uses, and government buildings. This area also contains the construction site where a new indoor sports arena is being built.

The portion of the study area west of the Sacramento River and north of the existing I-Street Bridge (CT 101.01 BGs 1 and 3) contains land uses that are primarily recreational and residential. River Walk Park borders the Sacramento River and currently terminates at the I Street Bridge overcrossing. Broderick Boat Ramp and Yolo County Park are also located in this quadrant along the west bank of the river. Residential uses, including single family residences and one multi-family complex along 3rd Street are located behind the recreational/waterfront uses.

The portion of the study area west of the Sacramento River and south of the existing I Street Bridge (CT 101.01 BG 4) contains a variety of land uses. River Walk Park borders the west bank of the Sacramento River and is a prominent recreational feature in this portion of the study area. Two large buildings, the Ziggurat Building and a state building, are located west of River Walk Park. Residential uses are located further west and include single- and multi-family homes.

2.1.1 Land Use Designations

Most of the land in the Sacramento portion of the study area is designated as Urban Center Business District and Urban Center High. Old Sacramento is designated as Traditional Center, and the riverfront is designated as Recreational. See Figure 2-2 for the general plan land use designations in the Sacramento portion of the study area.

The West Sacramento portion of the study area contains a mix of land uses, including single- and multi-family residential, commercial, office, public/quasi public, and industrial. There are several vacant properties in the West Sacramento portion of the study area as well (Mintier Harnish 2009). See Figure 2-3 for the general plan land use designations in the West Sacramento portion of the study area.

2.1.2 Development Trends

2.1.2.1 City of Sacramento

SACOG's 2035 MTP/SCS projects that the region will have approximately 1.3 million employees and 1.2 million housing units by 2035. Sacramento is expected to contain roughly 20 percent of the region's housing and nearly 30 percent of the region's jobs.

The 2035 General Plan identifies that most of the development in the Sacramento portion of the study area will be infill development. In October 2009, the Sacramento City Council identified priority "shovel ready" sites, including Tier One areas where development is likely to occur in the near term. The majority of the Sacramento portion of the study area is identified as a Tier One shovel ready site, with a high likelihood of job and housing growth by 2030 (City of Sacramento 2015).

2.1.2.2 City of West Sacramento

West Sacramento has experienced rapid population growth since 1990, which has brought significant land use change including new residential development in the outlier areas and redevelopment within existing built-up areas. West Sacramento has adopted five specific plans to help guide and implement land use planning in different areas of the city (Mintier Harnish 2009:Figure 2-5). The Washington Specific Plan pertains to land use in the study area.

The Washington Specific plan covers the portion of the study area north of the existing I Street Bridge. It establishes a framework for long-term redevelopment, and includes a single family housing development, the CalSTRS government building, and the Raley's Landing mixed-use project. (City of West Sacramento 1996).

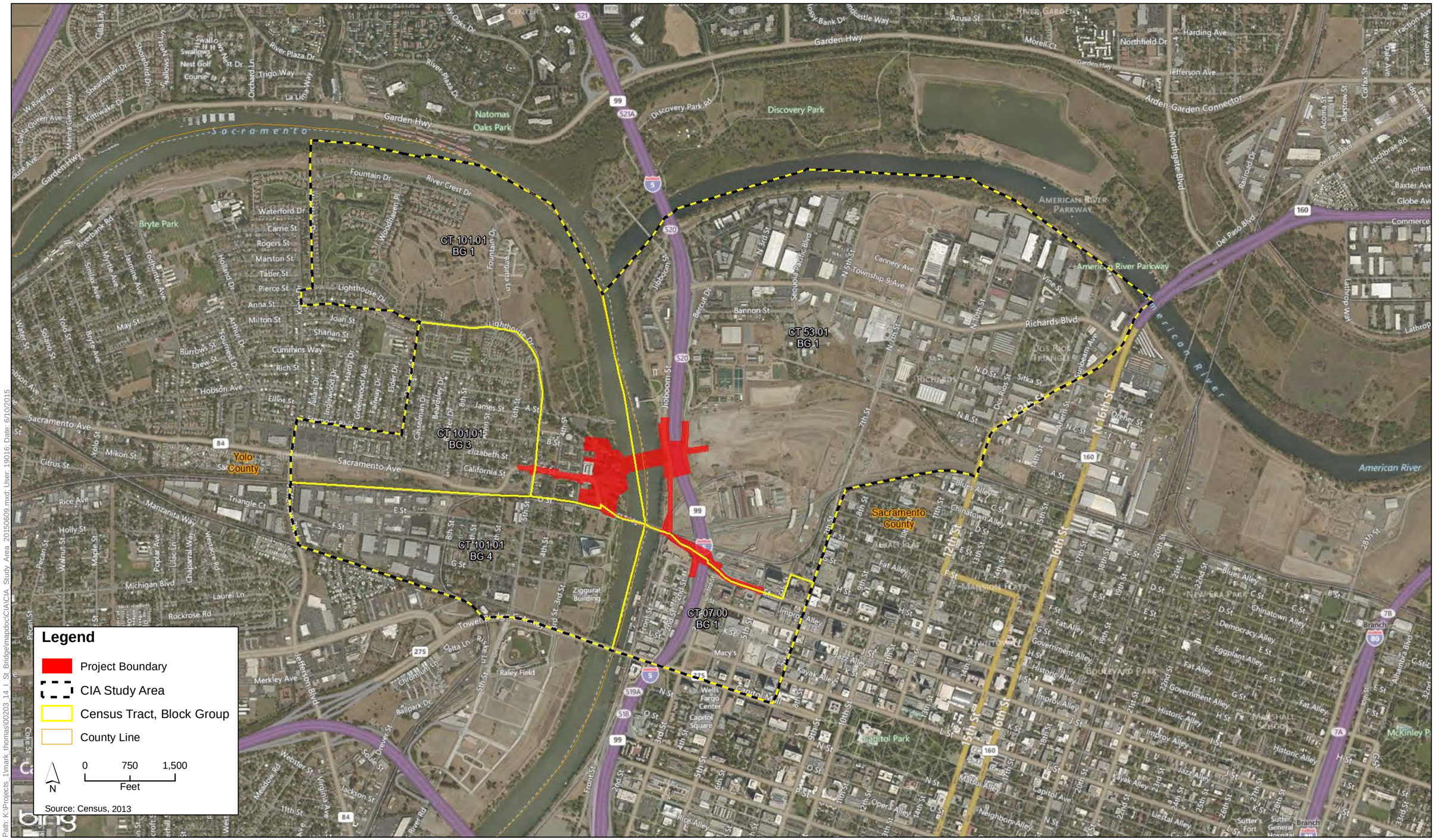

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Figure 2-1
CIA Study Area

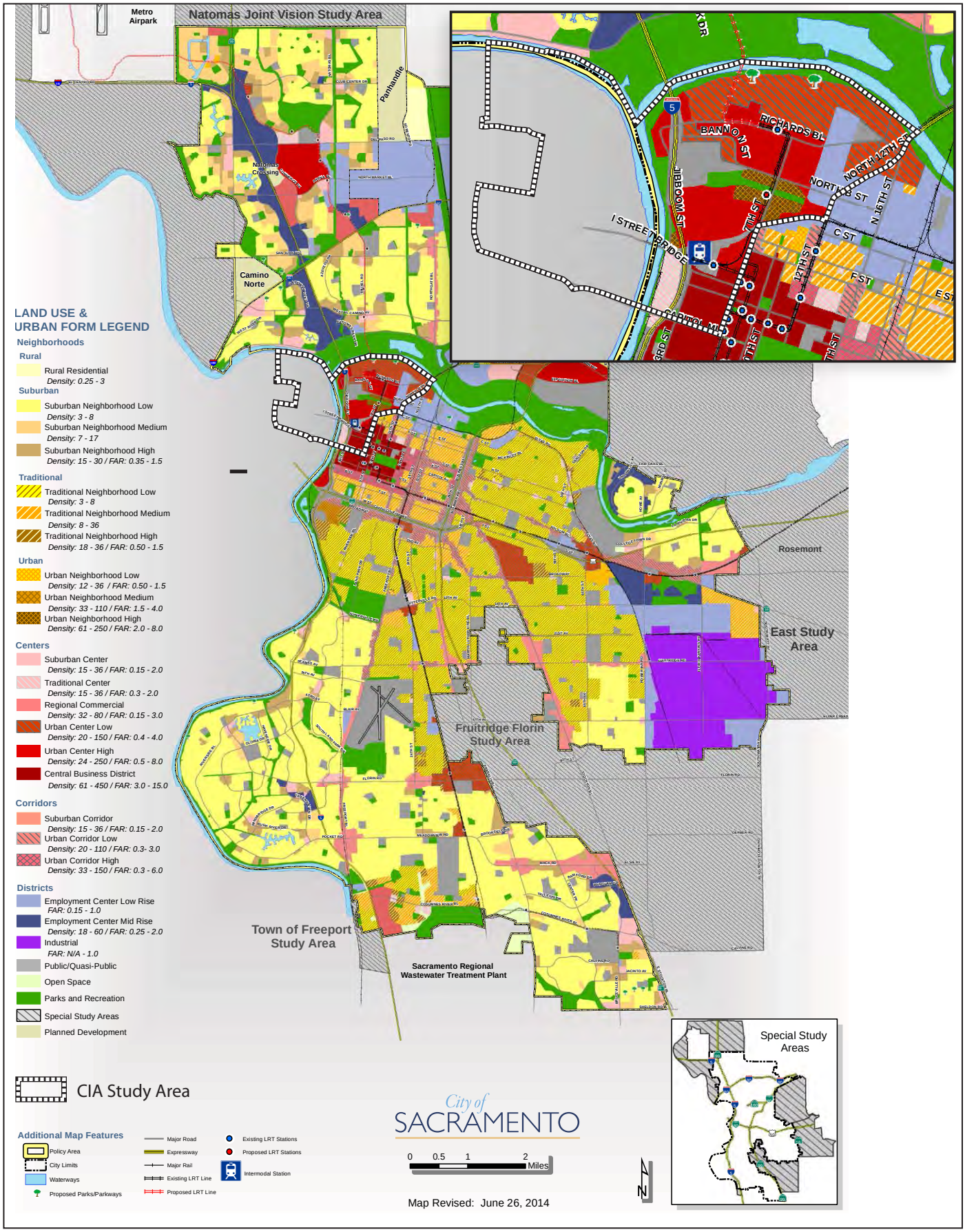

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Figure 2-2
Existing Land Uses, City of Sacramento, Sacramento County

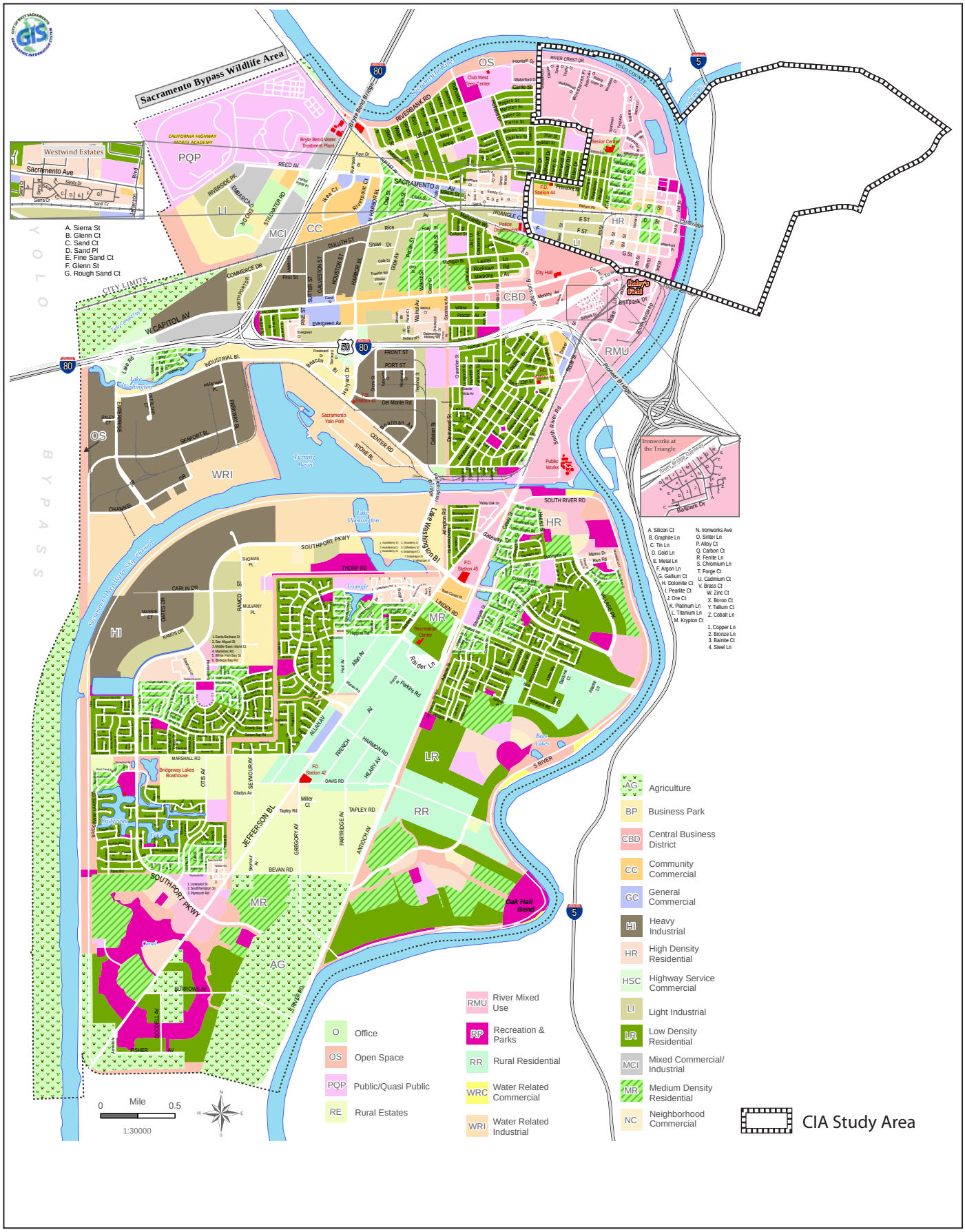

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Figure 2-3
Existing Land Uses, City of West Sacramento, Yolo County

Discovery Park
Pear Paseo
Victory Park
Tiscornia Park
Peach Paseo
Victory Promenade
Sacramento River Parkway Trail
Persimmon Paseo
Recreation Corridor
Park Site CC3
Smythe Academy
Governor's Residence State Park
City of Sacramento Police Department
Broderick Boat Ramp
Elkhorn Village Elementary School
Yolo County
Sacramento County
Off-Leash Dog Park
Park Site CC4
West Sacramento Fire Department Station 44 (905 Fremont Street)
River Walk Park
Matsui Waterfront Park
Park Site CC5
Crossings Yard
City of West Sac Police Department
Heritage Green
Park Site CC6
Riverfront Park
Depot Park
Sacramento Fire Department
Washington Plaza
River Walk Park
Access Corridor
Old Sacramento State Historic park
River Walk Trail
Sacramento River Parkway (Future)
West Sacramento Fire Department Station 41 (132 15th Street)

Legend

- Project Boundary
- CIA Study Area
- Existing Bike Route
- Community Resources

Parks

- Existing Park
- Proposed Park

N

0 750 1,500
Feet

Source: City of Sacramento, City of West Sacramento, and SACOG

Path: K:\Projects_1\mark_thomas\00203_14_I_St_Bridge\mapdoc\CIA\Fig_2_4_Community_Resources_20151209.mxd; User: 19393; Date: 1/21/2016

Figure 2-4
Community Resources

2.1.3 Adopted Plans and Programs

2.1.3.1 City of Sacramento 2035 General Plan

In March of 2015 the City of Sacramento adopted the 2035 General Plan to set a new direction for the future of the city. The 2035 General Plan Vision provides the City's key values and aspirations for Sacramento's future. The overarching Vision of the General plan is to make Sacramento the most livable city in America. In conjunction with the Vision Statement, the City Council adopted Guiding Principles for land use, urban design, housing, mobility, economic development, public safety, environmental resources, parks and recreation, and services and facilities. The principles establish policy benchmarks for the rest of the General Plan. Specific policies and implementation measures of the 2035 General Plan are further discussed in Chapter 3.

2.1.3.2 Railyards Specific Plan

The Railyards Specific Plan (City of Sacramento 2007) comprises a 244-acre area in downtown Sacramento located immediately north of the Central Business District, east of the Sacramento River, south of North B Street and west of the federal courthouse and the Alkali Flat neighborhood. The Sacramento Railyards Specific Plan is intended to advance the policies of the General Plan to create more mixed-use, transit-oriented neighborhoods within the Central City.

2.1.3.3 River District Specific Plan

The City of Sacramento adopted the River District Specific Plan in 2011. This plan establishes planning and design standards for the redevelopment of approximately 773 acres of land located at the confluence of the American and Sacramento Rivers, north of the downtown core of the City of Sacramento. The vision of the River District Specific Plan is to create a vibrant, mixed-use community served by a network of bicycle and pedestrian-friendly routes (City of Sacramento 2011).

2.1.3.4 Sacramento River Parkway Plan

In 1975 the Sacramento River Parkway Master Plan was adopted by the City Council and incorporated into the Open Space Element of the General Plan. It was updated in 1997 to reflect changes in the parkway, including the South Natomas Community Plan area, and other proposed land uses in the downtown area. The Sacramento River Parkway Plan is a twenty year policy guide for habitat restoration and recreational development for lands adjacent to the river (City of Sacramento 1997).

The Sacramento River Parkway Plan area is located along the easterly bank of the Sacramento River within the City limits of Sacramento and is approximately 17 miles in length and 820 acres in area. The boundaries of the area generally are the City limits inclusive of South Natomas to the north, the Sacramento River on the west, City limits at Freeport on the South, and Interstate 5 Freeway on the east (City of Sacramento 1997).

2.1.3.5 The City of Sacramento Pedestrian Master Plan (2006)

The 2006 City of Sacramento Pedestrian Master Plan is a comprehensive vision for improving pedestrian conditions over the next twenty years. The Pedestrian Master Plan presents a set of goals and strategies to achieve this vision and includes a framework for creating an improved pedestrian environment. The overall purpose of the Pedestrian Master Plan is to make Sacramento a model pedestrian-friendly city – the "Walking Capital" (City of Sacramento 2006).

2.1.3.6 2010 Sacramento City/County Bikeway Master Plan

The 2010 City/County Bikeway Master Plan was developed to serve the recreational and transportation needs of the public. The Plan includes all of Sacramento County which consists of 997 square miles and 3,887 miles of public roads. The goal of the Plan is to develop a comprehensive plan which will meet the needs of all bicyclists (Sacramento City-County Bikeway Task Force 2010).

2.1.3.7 Sacramento River Crossings Alternatives Study

In 2010 the City of Sacramento approved a study to analyze the feasibility and impacts of potential new crossings of the Sacramento River. The study evaluates a variety of alternatives including a no-build option to a multiple crossings option. The study resulted in a final report on potential crossings locations, transportation impacts, and cost estimates.

2.1.3.8 City of West Sacramento General Plan

The incorporated City of West Sacramento abuts the City of Sacramento's General Plan Policy Area. West Sacramento's General Plan governs land uses in these areas. The Plan consists of nine sections that describe City policies related to land use, housing, transportation and circulation, public facilities and services, recreational and cultural resources, natural resources, health and safety, urban structure and design, and child care. The Plan also includes a section describing administration and implementation measures. Major land use goals of the Plan include:

- To provide for orderly, well-planned, and balanced growth consistent with the limits imposed by the City's infrastructure and the City's ability to assimilate new growth.
- To designate adequate land in a range of residential densities to meet the housing needs of all income groups expected to reside in West Sacramento.
- To designate adequate land and provide support for the development of commercial uses providing goods and services to West Sacramento residents and West Sacramento's market area.
- To designate adequate land and provide support for the development of office uses serving both West Sacramento and the region.
- To designate adequate land and provide support for light, heavy, and water-related industrial uses that create jobs and enhance the economy of West Sacramento.

- To designate adequate land for development of public and quasi-public uses to support existing and new residential, commercial, and industrial land uses (City of West Sacramento 2000).

Washington Specific Plan

The Washington Specific Plan covers a planning area of approximately 194 acres of urban land near the northeast corner of West Sacramento. The Plan Area is bounded by State Route 275 on the south, the Sacramento River on the east, A Street on the north, and portions of Sixth and Eighth Streets on the west. The Plan is intended to focus efforts by local residents, landowners, developers, and public officials to stimulate a transformation of the Washington area.

The main goals of the Plan are:

- To coordinate efforts between the Cities of West Sacramento and Sacramento.
- To capitalize on the Sacramento River and to make the adjacent areas a regional focal point.
- To integrate economic, residential and social development in the Washington area with the Triangle, Riverfront, and downtown Sacramento areas (City of West Sacramento 1996).

Washington Realized-Sustainable Community Strategy

The Washington Realized, a Sustainable Community Strategy, is intended to shift development patterns toward mixed-use growth that is served by public transit in the Washington Neighbhorhood in West Sacramento. It contains an infill development and infrastructure needs analysis, as well as an analysis of regulatory barriers and tranpsortation management. It also contains a section on neighborhood preservation, as Washington is the oldest neighborhood in West Sacramento. The purpose of Washington Realized is to identify baseline conditions, analyze the strenghths and barriers to sustainable development, and provide strategies and recommendations for action (City of West Sacramento 2015).

2013 West Sacramento Bicycle, Pedestrian, and Trails Master Plan

The main goal of the West Sacramento Bicycle, Pedestrian, and Trails Master Plan (BPTMP) is to create a pedestrian and bicycle-friendly community and to increase the number of people in West Sacramento who bicycle or walk to work, to school, for errands, or for recreation. The BPTMP establishes goals, policies, implementation actions, and priorities for the development of bicycling and walking facilities in West Sacramento, as envisioned by the General Plan (City of West Sacramento 2013).

2.1.4 Parks and Recreational Facilities

Various parks and recreational facilities are scattered throughout the study area (Figure 2-4). The *I Street Bridge 4(f)Report* also discusses parks and recreational facilities in the project area as they relate to Section 4(f) of the Department of Transportation Act of 1966 (ICF International 2015a).

2.1.4.1 City of Sacramento Parks and Recreational Facilities

Tiscornia Park is located in CT 53.01 BG 1 at the confluence of the Sacramento and American Rivers at 195 Jibboom Street. This park provides riverfront access, as well as access to the American River Bike Trail.

Matsui Waterfront Park is located in CT 53.01 BG 1 just south of Tiscornia Park along the Sacramento River. This park connects Old Sacramento to Discovery Park. A second phase of development is planned for this park, which includes a group picnic and BBQ area, parking lot, and rehabilitation of the historic building for community use.

Old Sacramento State Historic Park is located in CT 07.00 BG 1, just south of the existing I Street Bridge and west of I-5. This area contains the Sacramento Railroad Museum and other historic buildings.

Several planned public parks are identified in the Sacramento Railyards Specific Plan. The planned parks and open space areas are shown in Figure 2-4.

2.1.4.2 City of West Sacramento Parks and Recreational Facilities

River Walk Park is located in CT 101.01 BG 4 along the west bank of the Sacramento River between the Tower Bridge and the existing I Street Bridge. This park contains picnic areas and provides access to the Sacramento River Walk Trail.

Broderick Boat Ramp is located in CT 101.01 BG 1, on 4th Street along the west bank of the Sacramento River. It contains a boat dock, covered picnic areas, restrooms, and a fish cleaning station.

There are several proposed parks identified in West Sacramento. River Walk Park will eventually extend from Broderick Boat Ramp to the I-80 river crossing. A 0.75 acre access corridor is proposed just south of the Ziggarat building, between 3rd Street and River Walk Park. Washington Plaza is a 0.38 acre urban plaza that would be located at the corner of 5th Street and E Street and would contain a gathering area, water feature, public art and game tables. Broderick Boat Ramp would be expanded to include a 1.5 acre dog park. Lastly, The City of West Sacramento Parks Master Plan identifies a proposed Governors Residence State Park, which would be located just west of the Sacramento River and north of Broderick Boat Ramp.

2.1.5 Farmland/Timberland

According to the state Farmland Mapping and Monitoring Program, the study area does not contain prime farmland, or farmland of state or local importance. No timberland is present. Farmland and timberland is not discussed further in this document.

2.2 Community Characteristics

This section describes the community characteristics of the study area, including its demographics, presence or lack of cohesion, and community facilities.

2.2.1 Population

There has been considerable growth in the Sacramento area between 2000 and 2010. The City of West Sacramento experienced significant annual growth—5.4%. Regional and local population changes for key jurisdictions from 2000 to 2010 are shown in Table 2-1.

Table 2-1. Existing Regional and Local Population Change

Area	2000	2010	Percent Change (%)	Average Annual Growth Rate (AAGR) (%)
California	33,871,648	36,637,290	8.2	0.8
Sacramento County	1,223,499	1,395,144	14.0	1.6
Yolo County	168,660	200,849	19.1	1.9
City of Sacramento	407,018	466,488	14.6	1.5
City of West Sacramento	31,615	48,744	54.2	5.4

Source: U.S. Census Bureau 2010.

2.2.1.1 Race/Ethnicity

As reported in the 2010 census (U.S. Census Bureau 2010), the total population of the City of Sacramento is 466,488. Of the total population, the largest group is White (approximately 35.5 percent), and persons of Hispanic or Latino origin of any race made up the next largest group (26.9 percent). The remaining population in descending order of proportion is Asian, Black or African American, Two or more races combined, Native Hawaiian/Pacific Islander, American Indian/Alaskan Native, and other (Table 2-2). The total population of the City of West Sacramento is 48,744 (U.S. Census Bureau 2010). Of the total population, the largest group is white (approximately 47.4 percent), and persons of Hispanic or Latino origin of any race made up the next largest group (31.4 percent). The remaining population in descending order of proportion is Asian, Black or African American/Two or more races combined, Native Hawaiian/Pacific Islander, American Indian/Alaskan Native, and other. Table 2-2 indicates the ethnic distribution of the relevant census tracts.

As shown in Table 2-2, several of the block groups within the CIA study area are more ethnically diverse compared to the cities of Sacramento and West Sacramento. CT 07.01 BG 1 and CT 53.01 BG 1 have higher percentages of Black or African American residents, and CT 101.01 BG 3 has a higher percentage of Hispanic residents than average for the cities of Sacramento and West Sacramento.

Table 2-2. Existing Regional and Local Race and Ethnicity Characteristics (2010)*

Area	Total Population	Hispanic or Latino (of Any Race)	%	Not Hispanic or Latino													
				White	%	Black or African American	%	American Indian or Alaskan Native	%	Asian	%	Native Hawaiian/ Pacific Islander	%	Other Race	%	Two or More Races	%
California	37,253,956	14,013,719	37.6	14,956,253	40.1	2,163,804	5.8	162,250	0.4	4,775,070	12.8	128,577	0.3	85,587	0.2	968,696	2.6
Sacramento County	1,418,788	306,196	21.6	687,166	48.4	139,949	9.9	7,875	0.6	198,944	14.0	13,099	0.9	3,418	0.2	62,141	4.4
Yolo County	200,849	60,953	30.3	100,240	49.9	4,752	2.4	1,098	0.5	25,640	12.8	817	0.4	443	0.2	6,906	3.4
City of Sacramento	466,488	125,276	26.9	161,062	34.5	64,967	13.9	2,586	0.6	83,841	18.0	6,392	1.4	1,253	0.3	21,111	4.5
West Sacramento	48,744	15,282	31.4	23,092	47.4	2,180	4.5	395	0.8	4,961	10.2	502	1.0	121	0.2	2,211	4.5
CT 07.00 BG 1	2,806	607	21.6	931	33.2	687	24.5	45	1.6	376	13.4	9	0.3	48	1.7	103	3.7
CT 53.01 BG 1	838	211	25.2	173	20.6	358	42.7	7	0.8	22	2.6	7	0.8	2	0.2	58	6.9
CT 101.01 BG 1	1,140	231	20.3	616	54.0	79	6.9	16	1.4	136	11.9	4	0.4	5	0.4	53	4.6
CT 101.01 BG 3	2,754	1,290	46.8	982	35.7	150	5.4	38	1.4	188	6.8	32	1.2	5	0.2	69	2.5
CT 101.01 BG 4	1,291	406	31.4	495	38.3	125	9.7	27	2.1	136	10.5	22	1.7	4	0.3	76	5.9

Source: U.S. Census Bureau 2010.

* Refer to Figure 2-1 for location of block groups included in this table

2.2.1.2 Income

According to the 2010 census (U.S. Census Bureau 2010), several block groups in the study area have a notably lower median household income and a lower per capita income than the respective cities, especially CT 07.00 BG 1, CT 53.01 BG 1, and CT 101.01 BG 4. Table 2-3 shows income and poverty statistics in the study area and region.

Table 2-3. Income and Poverty Statistics for the Study Area (2010)*

Area	Median Household Income	Per capita Income
California	$61,094	$29,527
Sacramento County	$55,064	$26,739
Yolo County	$55,918	$27,730
City of Sacramento	$49,753	$25,508
West Sacramento	$53,394	$24,827
CT 07.00 BG 1	$12,403	$10,123
CT 53.01 BG 1	$11,359	$5,453
CT 101.01 BG 1	$67,039	$53,855
CT 101.01 BG 3	$36,162	$16,433
CT 101.01 BG 4	$17,318	$6,783

Source: U.S. Census Bureau 2010.
* Refer to Figure 2-1 for location of census tracts included in this table

2.2.2 Community Cohesion

Community cohesion is the degree to which residents have a sense of belonging to their neighborhood; their level of commitment to the community; or a strong attachment to neighbors, groups, and institutions, usually as a result of continued association over time (Community Impact Assessment Handbook, California Department of Transportation [Caltrans], June 1997).

As described above, the study area is divided from east to west by the Sacramento River. Other dividing factors include I-5 and the UPRR tracks. Pedestrian and bicycle crossing is limited over the river and over/under the freeway and railroad tracks. Crossing these barriers public or private motorized transportation is possible only at designated overpasses.

The Sacramento side of the study area is comprised of a mix of land uses. The portion of the study area east of the Sacramento River and north of the existing I Street Bridge is made up of industrial land use, including the Sacramento Railyards and a WWTP. Old Sacramento is located between the Sacramento River and I-5, and downtown Sacramento is located east of I-5. These areas are mostly comprised of commercial and governmental land uses. There are some residences in this side of the study area, but they are scattered in small clusters. Because the land uses are so varied and because there are few residential uses in this portion of the study area, community cohesion is considered low in the Sacramento portion of the study area.

The West Sacramento side of the portion of the study area includes more residential and recreational uses. This portion of the study area is divided north and south by the UPRR tracks.

The neighborhood north of Sacramento Avenue contains sidewalks, schools, and parks. While there are many new land use changes to the West Sacramento side of the study area, including redevelopment near the waterfront, this neighborhood contains older homes, and residences that have likely been here for longer periods of time. West Sacramento residents shop and recreate locally. These factors indicate a cohesive community.

2.2.3 Community Facilities (Schools, Health Care)

The following section describes the community facilities in the study area. No libraries are located within the study area and libraries are not discussed further in this document. Community facilities and services are shown in Figure 2-4.

2.2.3.1 Schools

As shown in Figure 2-4, few schools are located in the study area. Smythe Academy is located in CT 53.01 BG 1 at 700 Dos Rios in Sacramento, approximately 1.12 miles northeast of the project boundary. Elkhorn Village Elementary School is located in CT 101.01 BG 3, at 750 Cummins Way in West Sacramento. It is approximately 0.5 miles northwest of the project boundary.

2.2.3.2 Health Care Facilities

There are no health care facilities within in the study area. The nearest major health care facilities to the study area include the UC Davis Medical Center at 2315 Stockton Blvd and Sutter General Hospital at 2801 L Street in Sacramento, and the West Sacramento Medical Center at 155 15th Street in West Sacramento. Health care facilities are not discussed further in this document.

2.2.4 Access, Circulation and Parking

2.2.4.1 Access

The primary roads in the project area and vicinity are shown on Figure 1-1. The I Street Bridge is one of three river crossings that connect Sacramento and West Sacramento, along with the Tower Bridge (Capitol Mall/West Capitol Avenue) and the Pioneer Memorial Bridge (US 50/Business-80). I-5 runs through the study area on the Sacramento side of the river. The primary arterials on the Sacramento side of the study area include I Street and J Street, and 2nd and 5th Streets. The primary arterials on the West Sacramento side of the study area include Jefferson Blvd, Tower Bridge Gateway, and 5th Street. Secondary arterials include Sacramento Avenue, C Street, Riverfront Street, and 3rd Street.

2.2.4.2 Circulation

In addition to roadways, the multimodal transportation system in the study area includes public transit, bikeways, pedestrian pathways/sidewalks and rail service.

Transit and Rail Services

The study area is well served by public transportation. Regional Transit operates a light rail in the Sacramento portion of the study area. The light rail provides service on the gold line from the Sacramento Valley Station (located within CT 53.01 BG 1 in the study area) through Downtown Sacramento and east to Rancho Cordova and Folsom. The blue line of the light rail provides service from South Sacramento near Florin Avenue and Meadowview Road to north Sacramento near Watt Avenue. The newer green line of the light rail provides service from Downtown Sacramento to 7th Street and Richards Boulevard, north of the Sacramento Valley Station. This line is projected to expand in the future north towards the community of Natomas. Regional Transit operates buses on 255 routes in the Sacramento area.

Yolo Bus provides transit service in Yolo County, primarily between Davis, Woodland, West Sacramento, and Sacramento. There are 14 regular bus routes, with an additional 6 commuter bus routes and 7 express bus routes that provide extra service during commute hours.

Pedestrian and Bicycle Facilities

A moderate amount of pedestrian and bicycle facilities are available in the study area. In Sacramento, there is an on-street Class II bike lane on Jibboom Street, and Class III bike lanes on 3rd Street and L Street. There is an off-street bike lane along Capitol Mall, and the Sacramento River Parkway trail is a Class I bike trail, located along the east bank of the Sacramento River throughout the study area. In West Sacramento, C Street is a Class III bike route from 3rd Street to 6th Street, Sacramento Avenue a Class II bike lane, and Lighthouse Drive contains Class I and Class II bike lanes (City of West Sacramento 2013:Figure 3).

Parking

Parking is provided throughout the study area both on-street and in public and private lots. The Sacramento portion of the study area contains various paid parking garages, including one on 3rd Street and L Street and two garages in Old Sacramento. Meter parking is available on most of the Downtown Sacramento and Old Sacramento streets in the study area. On-street parking and a small portion of the Ziggurat Building parking lot is available to the public in the West Sacramento portion of the study area. The government buildings and commercial properties/businesses in the West Sacramento portion of the study contain private lots.

2.3 Public Services and Utilities

The following section discusses public services (which includes police and fire protection) and utilities and communications providers in the study area.

2.3.1 Police Protection

2.3.1.1 City of Sacramento Police Department

The City of Sacramento Police Department, headquartered at 5770 Freeport Boulevard in Sacramento, provides law and traffic enforcement for the portion of the study area within the city of Sacramento. There is one station within the study area at 300 Richards Boulevard. The full-service department had approximately 891 officers in 2012 (sworn and civilian) (City of Sacramento Police Department 2012).

2.3.1.2 City of West Sacramento Police Department

The City of West Sacramento Police Department, headquartered at 550 Jefferson Boulevard in West Sacramento, provides law and traffic enforcement for the portion of the study area within the City of West Sacramento. The Department is divided into three offices: Administration, Investigations (which includes the Code Enforcement Division), and Operations. Police officers patrol 23.3 square miles. The Department is staffed with 71 sworn officers, 23 civilian officers, 8 part time officers, 18 parking enforcement officers, and 4 part-time, non-sworn staff. Other positions in the department include part-time police officers, parking enforcement officers, reserve police officers, and volunteers.

2.3.2 Fire Protection

2.3.2.1 Sacramento Fire Department

The City of Sacramento Fire Department provides fire protection and emergency medical services to the portion of the study area within the Sacramento city limits. Its service area is 146.3 square miles, and it serves a population of 516,167. Of the 24 active stations, the station nearest the project corridor is Station 14 at 1341 C Street in Sacramento. In 2012 the Sacramento Fire Department received 74,130 total calls (City of Sacramento Fire Department 2012).

2.3.2.2 Sacramento Metropolitan Fire District

The Sacramento Metropolitan Fire District (Metro Fire) is a combination of 16 smaller fire districts, including the Sacramento County Fire Protection District, that merged to create a California Special District. Metro Fire provides fire, rescue, and emergency medical services to an area of 417 square miles and a population of 640,000. There are approximately 155 on-duty personnel on any given day. In the 2013/2014 fiscal year, Metro Fire responded to 6,206 service calls (Sacramento Metropolitan Fire District 2015).

2.3.2.3 West Sacramento Fire Department

The West Sacramento Fire Department provides fire protection and emergency response services within the city limits and responds to emergencies in outlying areas when other Departments request aid. The West Sacramento Fire Department has 17 personnel on duty at a given time.

There are five stations in West Sacramento. The two nearest stations to the study area are Station 41 at 132 15th Street and Station 44 at 905 Fremont Street in West Sacramento.

2.3.3 Electricity and Natural Gas

The Sacramento Municipal Utilities District (SMUD) generates, transmits, and distributes electricity to a 900-square-mile territory that includes Sacramento, Sacramento County and a small portion of Placer County (Sacramento Municipal Utilities District 2015). SMUD provides electric service in the Sacramento County portion of the study area.

The Pacific Gas and Electric Company (PG&E) provides natural gas and electric service to approximately 16 million people throughout a 70,000-square-mile service area in northern and central California (Pacific Gas and Electric Company 2015). PG&E provides electric service to the City of West Sacramento, and natural gas service to the entire study area.

2.4 Economic Conditions

This section discusses the economic conditions of the study area and the surrounding region, including employment and income data and a description of business activity in the study area.

2.4.1 Regional Economy and Employment

2.4.1.1 City of Sacramento

In recent years, both residential and commercial development has declined due to a weak housing market, high foreclosure rates, and lack of financing. However, there are some positive trends that indicate this downward economic trend is reversing. Unemployment is falling (14.11 in 2011 to 10.8 in 2013). Sacramento also saw a slight increase in commercial development starting in 2012.

The Economic Development Strategy, adopted by the Sacramento City Council in 2007, establishes citywide economic development priorities. This strategic framework identifies key development opportunity areas and provides implementation plans that will help the City achieve its development goals. The 12th Street corridor, located between UPRR and I Street, is identified as a key area in this plan. The Richards Boulevard corridor, located between 12th Street and Jibboom Street, is also identified as a key area. The Downtown Plaza is identified as a strategic retail asset in this plan. The Downtown Plaza is currently undergoing major redevelopment as a new sports arena and mixed use development. Several waterfront areas, including Old Sacramento and Jibboom Street are identified for waterfront development opportunities.

Major employers in Sacramento include the following:

- Government Agencies (including California Air Resources Board, Caltrans, Disabled America Veterans, Employment Development Department, Environmental Protection agency, Municipal Services Agency, Water Resources Department, etc.)

- California State University, Sacramento
- Corrections Department
- Sacramento Regional Transit
- Sutter Memorial Hospital and UC Davis Medical Center
- Sacramento Bee
- SMUD

2.4.1.2 City of West Sacramento

The largest industry sectors in West Sacramento include transportation and warehousing (approximately 4,100 jobs), wholesale trade (approximately 3,100 jobs), retail trade (approximately 2,700 jobs), and manufacturing (approximately 2,100 jobs) (City of West Sacramento 2012).

Major employers in West Sacramento include Raley's, Tony's Fine Foods, United Parcel Service, Norcal Beverage, Beaulieu of America, Dennis Blazona Construction, Siemens Healthcare Diagnostics, FEDEX Freight, Capital Express Lines, Clark Pacific, and Ikea (City of West Sacramento 2012).

Chapter 3 Impacts

This chapter presents the findings of an evaluation of project-related effects on land use, growth, social characteristics (including environmental justice concerns), acquisition/ displacement/ relocation, and economic activity within the study area. Cumulative impacts of the project also are addressed.

3.1 Land Use

Land use impacts evaluated in the following sections include conflicts with existing and planned land uses; consistency with the applicable local planning documents, and impacts on parklands.

3.1.1 Consistency and Compatibility with Existing and Planned Land Uses

In general, the project would involve constructing a new bridge over the Sacramento River to replace the existing I Street Bridge vehicle crossing. Among its key purposes, the new bridge is intended to improve the connectivity to, and accessibility of, businesses, recreational areas, and new or redevelopment opportunity sites located in the urban core of Sacramento and West Sacramento. The project would require acquisitions of land from adjacent parcels, which would displace existing uses. Removal of these land uses, which include strips of recreational and residential use, would not significantly alter the overall land use make-up of the study area. The changes in land use would be consistent and compatible with existing land uses. Acquisitions and relocations are discussed in more detail in section 3.2.3.

3.1.2 Consistency with State, Regional, and Local Plans and Programs

The following sections assess the project's consistency with plans and policies adopted by the City of Sacramento, and the City of West Sacramento. Only policies with direct relevance to the project were included in the consistency analysis.

3.1.2.1 City of Sacramento General Plan

The *City of Sacramento General Plan 2035* was reviewed to identify policies relevant to the project. The project's consistency with relevant policies is discussed below.

Mobility Element

Goal M 1.1 Comprehensive Transportation System. Provide a transportation system that is effectively planned, managed, operated, and maintained.

Policy M 1.1.2 Travel System. The City shall manage the travel system to ensure safe operating conditions. (SO)

Policy M 1.1.4 Facilities and Infrastructure. The City shall effectively operate and maintain transportation facilities and infrastructure to preserve the quality of the system. (SO)

The purpose of and need for the project is to replace the deficient I Street Bridge with a new bridge, which would enhance the safety of the crossing. The project is consistent with these policies.

Goal M 1.2 Multimodal System. Provide expanded transportation choices to improve the ability to travel efficiently and safely to destinations throughout the city and region.

Policy M 1.2.1 Multimodal Choices. The City shall promote development of an integrated, multi-modal transportation system that offers attractive choices among modes including pedestrianways, public transportation, roadways, bikeways, rail, waterways, and aviation and reduces air pollution and greenhouse gas emissions. (MPSP/SO)

Policy M 1.2.3 Multimodal Access. The City shall promote the provision of multimodal access to activity centers such as commercial centers and corridors, employment centers, transit stops/stations, airports, schools, parks, recreation areas, and tourist attractions. (MPSP/SO)

Goal M 1.3 Barrier Removal. Improve system connectivity by removing barriers to travel.

Policy M 1.3.3 M 1.3.3 Eliminate Gaps. The City shall eliminate "gaps" in roadways, bikeways, and pedestrian networks.

a. The City shall construct new multi-modal crossings of the Sacramento and American Rivers.
b. The City shall plan and seek funding to construct grade-separated crossings of freeways, rail lines, canals, creeks, and other barriers to improve connectivity.
c. The City shall construct new bikeways and pedestrianways in existing neighborhoods to improve connectivity. (MPSP/SO)

Policy M 1.3.6 Multi-Jurisdictional Transportation Corridors. The City shall work with adjacent jurisdictions to identify existing and future transportation corridors that should be linked across jurisdictional boundaries so that sufficient right-of-way may be preserved. (IGC)

Goal M 2.1 Integrated Pedestrian System. Design a universally accessible, safe, convenient, and integrated pedestrian system that promotes walking.

Policy M 2.1.2 Sidewalk Design. The City shall require that sidewalks wherever possible be developed at sufficient width to accommodate pedestrians including the disabled; a buffer separating pedestrians from the street and curbside parking; amenities; and allow for outdoor uses such as cafes. (MPSP)

Policy M 2.1.5 Continuous Network. The City shall provide a continuous pedestrian network in existing and new neighborhoods that facilitates convenient pedestrian travel free of major impediments and obstacles. (MPSP)

Policy M 2.1.12 Safe Sidewalks. The City shall develop safe and convenient pedestrianways that are universally accessible, adequately illuminated, and properly designed to reduce conflicts between motor vehicles and pedestrians. (RDR)

Goal M 3.1 Safe, Comprehensive, and Integrated Transit System. Create and maintain a safe, comprehensive, and integrated transit system as an essential component of a vibrant transportation system.

Policy M 3.1.14 Streetcar Facilities. The City shall support the development of streetcar lines in the Central City and other multi-modal districts. (MPSP)

Goal M 4.1 Roadway System. Create a roadway system that will ensure the safe and efficient movement of people, goods, and services that supports livable communities and reduces air pollution and greenhouse gas emissions.

Policy M 4.1.5 Bridge Crossings. The City shall continue to work with adjacent jurisdictions to establish the appropriate responsibilities to fund, evaluate, plan, design, construct, and maintain new river crossings. (IGC)

Goal M 4.2 Complete Streets. Provide complete streets that balance the diverse needs of users of the public right-of-way.

Policy M 4.2.4 Pedestrian and Bicycle Facilities on Bridges. The City shall identify existing and new bridges that can be built, widened, or restriped to add pedestrian and/or bicycle facilities. (MPSP)

Goal M 5.1 Integrated Bicycle System. Create and maintain a safe, comprehensive, and integrated bicycle system and support facilities throughout the city that encourage bicycling that is accessible to all.

Policy M 5.1.1 Bikeway Master Plan. The City shall maintain and implement a Bikeway Master Plan that carries out the goals and policies of the General Plan. All new development shall be consistent with the applicable provisions of the Bikeway Master Plan. (MPSP)

The project represents collaboration between the Cities of Sacramento and West Sacramento and Caltrans to enhance the roadway system and multi-modal opportunities in the study area. The project will improve connectivity and accessibility between the two cities, as well as improve bicycle and pedestrian facilities. The project is consistent with the goals and policies listed above. The project also would not preclude the future development of a streetcar system as a separate project.

3.1.2.2 Railyards Specific Plan

The *Railyards Specific Plan* (2007) was reviewed to identify policies directly relevant to the project. The project's consistency with relevant policies is discussed below.

Goal S-1: Maximize the use of sustainable development practices in the Plan Area.

Policy S-1.6: Promote the installation of pedestrian and bicycle facilities to encourage walking and bicycling, thereby decreasing dependence on motorized vehicles.

Goal CC-1: Create an intensive mixed-use transit oriented urban environment that will become an integral part of the Central City.

Policy CC-1.3: Require active and public- oriented ground level uses that contribute to the pedestrian environment.

Goal OS-1: Provide a system of parks, open space and recreational facilities that serves the needs of future residents and employees of the Plan Area, and that enhances the overall identity of the Central City and the Railyards.

Policy OS-1.3: Utilize opportunities provided by planned open spaces to provide functional and attractive pedestrian and bicycle connections through the Plan Area and to adjacent open space areas such as the Riverfront.

Goal C-3: Create a walkable street system that extends the unique qualities of downtown neighborhoods gives structure and orientation to the downtown experience and enhances the pedestrian environment.

Policy C-3.3: Create and maintain attractive, functional streetscapes that integrate vehicular traffic, pedestrian, bicycle on-street parking and incorporate traffic calming features.

Policy C-3.4: Enhance the non-vehicular environment by developing streets at a scale that is suitable and attractive for pedestrians and bicyclists.

Goal C-4: Extend and improve the existing system of bicycle circulation in downtown Sacramento that is safe and efficient.

Policy C-4.1: Provide bicycle connections to improve circulation.

Policy C-4.2: Provide both on-street and off-street bikeways that provide connectivity within the development and connect to existing and planned bikeways along the Plan Area boundary.

Goal C-5: Create and reinforce safe and efficient pedestrian connections within the Plan Area and in relation to surrounding districts.

Policy C-5.1: Extend pedestrian connections from the downtown area into the Plan Area, as well as Old Sacramento, the Riverfront and the Richards Boulevard area.

Policy C-5.3: Provide safe pedestrian linkages to public spaces, such as schools, transit facilities, riverfront, parks and plazas.

The *Railyards Specific Plan* was developed prior to the decision to replace the existing I Street Bridge with a new bridge. This was a key factor in developing design alternatives for the new I Street Bridge because the Plan area network has a high priority placed on creating a street system that accommodates walking and bicycling. The project will improve connectivity and accessibility of bicycle and pedestrian facilities. The project is consistent with the goals and policies listed above.

3.1.2.3 River District Specific Plan

The *River District Specific Plan* (2011) was reviewed to identify policies directly relevant to the project. The project's consistency with relevant policies is discussed below.

Circulation

Goal C1: Maximize vehicle and pedestrian/bicycle connections within and between the River District and surrounding neighborhoods.

Policy C1b: Improve the design of major streets including North 16th Street, North 12th Street, North 7th Street, Jibboom Street and Richards Boulevard to enhance walkability while moving traffic as smoothly as possible through the District.

Goal C6: Provide pedestrian and bicycle paths, lanes and routes suitable for recreational and commuting purposes.

Policy C6a: Ensure bicycle and pedestrian trails and routes provide seamless connections within and beyond the River District.

Policy C6d: Improve and increase access to and along the rivers for bicycles and pedestrians.

The project will improve connectivity and accessibility of bicycle and pedestrian facilities. The project is consistent with the goals and policies listed above.

3.1.2.4 Sacramento River Parkway Plan

The *Sacramento River Parkway Plan* (1975, Updated 1997) was reviewed to identify policies relevant to the project. The project's consistency with relevant policies is discussed below.

General Policies

Policy G3. There should be close coordination among all public jurisdictions, including, but not limited to the City of Sacramento, the County of Sacramento, Yolo County, the City West Sacramento, and the State Lands Commission in the planning and development of the Sacramento River resources.

Policy G7. Land adjacent to the Parkway shall be protected from injurious or incompatible elements associated with Parkway land uses.

The project involves acquisition of approximately 1.246 acres of the Sacramento River Parkway. The project is a collaboration between the Cities of Sacramento and West Sacramento and Caltrans to construct an improved bridge, which will improve accessibility to the Sacramento River Parkway. The acquisition of 1.246 acre does not represent a significant portion of the parkway, and does not preclude the use of the recreational areas.

3.1.2.5 The City of Sacramento Pedestrian Master Plan (2006)

The City of Sacramento Pedestrian Master Plan is a comprehensive vision for improving pedestrian conditions over the next twenty years. The Plan includes a framework for creating an improved pedestrian environment. The project's consistency with relevant goals and policies are discussed below.

Goal 3: Provide crossings that are convenient and comfortable for pedestrians to use.

Policy. Provide connections over barriers such as railroads, waterways, and freeways.

The project replaces the I Street Bridge with a new bridge that includes improved and pedestrian facilities. It will enhance accessibility for pedestrians and bicyclists traveling over the Sacramento River between the two cities, as well as contribute to the walkability of the riverfront. The project is consistent with the goals and policies listed above.

3.1.2.6 2010 Sacramento City/County Bikeway Master Plan

The *2010 Sacramento City/County Bikeway Master Plan* was developed to serve the recreational and transportation needs of the public. The Plan includes all of Sacramento County which consists of 997 square miles and 3,887 miles of public roads. The following goals and policies relating to community impacts are listed below.

The Bikeway Master Plan Goal: To develop a comprehensive updated Sacramento City/County Bikeways Master Plan which will meet the needs of the bicyclists.

Objective: Coordination. To develop and maintain a coordinated approach by City/County and other agencies to implement the plan as funding becomes available or as development occurs.

Policy (1): Integrate efforts of planning, recreation, public works, and other departments of city and county government and other agencies that are involved in planning, construction or operational elements of the bikeway system.

Objective: Safety and Security. To achieve the highest possible level of safety and security for cyclists.

Policy (1): Provide a network of safe and convenient bikeways.

Objective: Aesthetics. To develop a bikeway system which incorporates aesthetics and the historical characteristics of the Sacramento area.

Policy (1) Bikeways should take full advantage of the beauty and natural features of the Sacramento area by blending with the terrain and topography.

Objective: Implementation. To take necessary actions to implement the preceding Sections 1 thru 5.

Policy (5) At the time of new street construction, pavement overlays, or seal coat operations, all bikeways within the project limits as detailed in this master plan shall be implemented.

The goal of the Plan is to develop a comprehensive and integrated system which will meet the needs of all bicyclists. The proposed project seeks to improve accessibility to bicycle and pedestrian access across the Sacramento River, and is consistent with the policies listed above.

3.1.2.7 City of West Sacramento General Plan

The *City of West Sacramento General Plan* was reviewed to identify policies directly relevant to the project. The project's consistency with relevant policies is discussed below.

> Recreational and Cultural Resources Element
>
> **Goal E: To provide a network of pedestrian and bicycle pathways connecting parks and open space areas with other destination points within and beyond the city of West Sacramento.**
>
> Policy 5. The City shall coordinate with SACOG and surrounding jurisdictions to ensure that bicycle pathways within the city connect with existing and planned facilities outside the city
>
> Transportation and Circulation Element
>
> **Goal A: To create and maintain a roadway network which will ensure the safe and efficient movement of people and goods throughout the city.**
>
> Policy 13. The City shall work with Caltrans and the City of Sacramento in improving the pedestrian and traffic-carrying capacity of the Tower Bridge and the I-Street Bridge, and in the development of future bridges.
>
> **Goal G: To promote pedestrian and bicycle travel as alternatives to automobile use.**
>
> Policy 8. All new bridge crossings shall include bicycle and pedestrian pathways.
>
> Urban Structure and Design Element
>
> **Goal B: To enhance the relationship between the City and the Sacramento River**.
>
> Policy 6. The City shall promote the enhancement of the areas where the "I" Street and Tower Bridges meet the riverfront to create strong, positive, and memorable entryways into West Sacramento and to reinforce the historical significance of these bridges.

The project replaces the I Street Bridge with a new bridge that includes improved bicycle and pedestrian facilities. It will enhance accessibility between the two cities, as well as contribute to the development of both riverfronts. The project is consistent with the goals and policies listed above.

3.1.2.8 Washington Specific Plan

The *Washington Specific Plan* (1996) was reviewed to identify policies relevant to the project. The project's consistency with relevant policies is discussed below.

Transportation and Circulation

Goal 3A. To create and maintain a roadway network in the Washington Plan Area that will ensure the safe and efficient movement of people and goods within and through the Plan Area.

Policy 3.A.3. The City shall work with Caltrans and the City of Sacramento in improving the traffic and pedestrian carrying capacity of the Tower Bridge and the I-Street Bridge and to provide more direct connections from these bridges into the Washington Plan Area.

Goal 3C. To encourage communication and cooperation within the community, with adjacent jurisdictions, and with state and federal agencies concerning transportation issues affecting the Washington Plan Area.

Policy 3.C.2. The City should continue to cooperate with the City of Sacramento to establish roadway, pathway, and river transportation links between Washington Plan Area and Sacramento.

Goal 6.B. To enhance the relationship between the Washington Plan Area and the Sacramento River.

The project will improve access for all forms of transportation across the Sacramento River. It also provides an enhanced connection between the Washington Plan Area and Sacramento. The project is consistent with the goals and policies listed above.

3.1.2.9 Washington Realized-Sustainable Community Strategy

The *Washington Realized Sustainable Community Strategy* (City of West Sacramento 2015) was reviewed for consistency with the proposed project. An overall goal of this document is to focus on transit-oriented development. The proposed project is aligned with this goal because it would improve local connectivity and access to local businesses, including the Washington neighborhood and adjacent riverfront recreation and development. The proposed project does not preclude future transit developments, such as the streetcar. It also improves bicycle and pedestrian facilities across the bridge, which are all a part of the Washington Realized transit-oriented development strategy. Washington Realized makes recommendations for future land use and transportation strategies and policies that could be included in an updated General Plan or a Specific Plan. Washington Realized currently recommends a roadway cross-section for C Street that is different than what is proposed by the proposed project. Should the cross-section proposed by Washington Realized become a policy of West Sacramento in the future, the I Street Bridge project would potentially conflict with that future, not yet adopted, policy. However, it is not yet known what recommendations will ultimately be adopted.

3.1.2.10 West Sacramento Bicycle, Pedestrian, and Trails Master Plan

The *West Sacramento Bicycle, Pedestrian, and Trails Master Plan* (Fehr & Peers 2013) was reviewed to identify policies directly relevant to the project. In addition to the City's General Plan policies, the Master Plan identifies specific policies relating to Bicycle, Pedestrian, and Trails. The project's consistency with these relevant policies is discussed below.

> Policy 2. A continuous and interconnected system of bikeways and walkways that provide safe and convenient travel to key destinations.
>
> Policy 4. A transportation system that is safe for bicycling and walking such that bicyclist- and pedestrian vehicle collision rates decrease from 2013 levels

The project improves bicycle and pedestrian access across the Sacramento River, and is consistent with the policies listed above.

3.1.3 Parks and Recreational Facilities

As stated in Chapter 2, multiple parks, trails, and open space areas are located throughout the study area, particularly along the riverfront. This section discusses the parks and trails adjacent to proposed improvements with the potential to be directly or indirectly affected by project construction or operation. Other parks and recreational facilities in the study area are not anticipated to experience changes in access or use as a result of the project. Public park and recreational facilities are also shown in Table 3-2 below, in Section 3.2.3, Acquisitions and Relocations, and analyzed in detail in the *Section 4(f) Report* prepared for this project. The complete Section 4(f) evaluation can be found in the *Draft Section 4(f) Report* (ICF International 2015a).

The project would result in both temporary and permanent impacts to the riverfront parks in both the Sacramento and West Sacramento portions of the study area. In Sacramento, approximately 2.155 acres would be acquired from the Sacramento River Parkway (parcels 002-010-023 and 001-210-018). Both of these parcels are owned by the State of California. The Sacramento River Parkway Trail is routed through these two parcels along the river and would require a detour during construction. No acquisitions would be required at Matsui Waterfront Park. 1.123 acres would be acquired from a future park site in Sacramento (Park Site CC6). Construction of the project with either of the City of Sacramento Roadway Design alternatives would result in the same amount of right-of-way acquisitions.

In West Sacramento under City of West Sacramento Residential Access Alternative 1, approximately 0.989 acre would be acquired from the southern portion of Broderick Boat Ramp. Under City of West Sacramento Residential Access Alternative 2, approximately 0.135 acre would be acquired from the park. While the City of West Sacramento Residential Access Alternative 1 would have the larger impact on this park, under both alternatives the area that would be acquired is at the southern portion of the park, away from the boat ramp and other developed facilities. The proposed River Walk Park area north of the existing I Street Bridge would also be affected. Under both City of West Sacramento Residential Access Alternatives, 3.083 acres would be acquired from this proposed park site (parcels 010-102-004, 010-102-003, 010-102-002, 010-102-010, and 010-372-010).

Overall, the parkland acquisitions required for the project would be minor and would not affect the overall viability of the parks and recreational facilities in the community. The project would result in an acquisition from the Sacramento River Parkway, but it would not significantly alter the recreational opportunities in that area, which mainly include use of the Sacramento River

Parkway Trail. The trail would be detoured for two years, and then would be restored within the Sacramento River Parkway. As stated above, the project would require temporary re-routing of the Sacramento River Parkway trail along Jibboom Street during construction. The temporary alignment for the trail would follow the temporary Jibboom Street alignment south of Railyards Boulevard. Northbound cyclists and pedestrians would then follow a detour north along Bercut Drive to Richards Boulevard, where they could connect back to the Parkway on the west side of I-5. The detour would be in place for approximately 2 years.

3.1.4 Growth Inducement

This section discusses the potential growth inducement impacts of the project on the areas most likely to be affected, which are anticipated to be the Cities of Sacramento and West Sacramento.

3.1.4.1 NEPA and CEQA Basis for Analysis of Growth Inducement Impacts

The findings of the growth analysis contained in this report will be used as the basis for the assessment of growth inducement effects in the project's NEPA/CEQA environmental document. Therefore, NEPA and CEQA considerations are relevant to the growth analysis presented in this section.

The President's Council on Environmental Quality (CEQ) regulations, which implement NEPA, require evaluation of the potential environmental consequences of all proposed federal activities and programs. This provision includes a requirement to examine indirect consequences that may occur in areas beyond the immediate influence of a proposed action at some time in the future. The CEQ regulations refer to these consequences as *secondary impacts* (40 Code of Federal Regulations [CFR] 1508.8). Secondary impacts may include changes in land use, economic vitality, and population density—all of which are elements of growth.

CEQA also requires analysis of a project's potential to induce growth. The State CEQA Guidelines (Section 15126.2[d]) require that environmental documents:

> [d]iscuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristics of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

Based on this guidance, growth inducement impacts would result from a project that would directly or indirectly foster (i.e., promote or encourage) additional economic or population growth or construction of additional housing. Fostering of growth can occur when an obstacle to growth is removed (e.g., when expansion of infrastructure resolves growth-constraining capacity problems). For an analysis to reach the conclusion that a project is growth-inducing, as defined

by CEQA, it must find that a project would foster additional growth in economic activity, population, or housing.

If the analysis determines that a project is growth-inducing, the next question is whether that growth may cause adverse effects on the environment. Environmental effects resulting from induced growth fit the CEQA definition of *indirect effects* in State CEQA Guidelines Section 15358(a)(2). These indirect or secondary effects of growth may result in significant environmental impacts. CEQA does not require that an environmental impact report (EIR) prepared for a project speculate unduly about the precise location and site-specific characteristics of significant indirect effects caused by induced growth, but a good faith effort is required to disclose what is feasible to assess. Potential secondary effects of growth could include consequences that result from growth fostered by a project (e.g., conversion of open space to developed uses, increased demand on community and public services and infrastructure, increased traffic and noise, degradation of air and water quality, or degradation or loss of plant and wildlife habitat).

If significant indirect environmental effects of growth may occur, the final question is whether those effects already have been considered and mitigated, or overridden if unavoidable, in a completed CEQA process. If the induced growth is consistent with an approved general plan or community plan for the area, and if a CEQA document on that plan adequately addresses the effects of growth, the environmental effects of growth induced by the project already have been evaluated. In this circumstance, the EIR for a project may refer to the completed CEQA document for the impact analysis and does need not reevaluate previously identified impacts. A project that would induce growth not consistent with an adopted general plan or community plan could indirectly cause additional significant environmental impacts beyond those evaluated in the earlier CEQA document on the plan.

Growth inducement may constitute an adverse impact if the growth is not consistent with or accommodated by the land use plans and growth management policies for the affected area. Local land use plans provide development patterns and growth policies that allow orderly expansion of urban development that is supported by adequate urban public services (e.g., water supply, roadway infrastructure, and sewer service). A project that would induce *disorderly growth* (i.e., conflict with the local land use plans) could indirectly cause additional adverse environmental impacts and other public service impacts, sometimes referred to as *secondary impacts*. Therefore, to assess whether a growth-inducing project would result in adverse secondary effects, it is important to assess the degree to which the growth accommodated by the project would be consistent with applicable land use plans.

A transportation improvement, such as the proposed project, would be considered growth-inducing if it would cause economic or population increases greater than what is planned by the local agency without the project. If the improvement would cause new development and an influx of residents, as well as increase the economic strength in an area, it may be growth-inducing. It is not assumed that growth in an area is fundamentally beneficial, detrimental, or of little significance to the environment.

The decision to allow potentially induced growth is the subject of separate decision making by the lead agency responsible for allowing such projects to move forward. Because the decision to

allow growth is subject to separate discretionary decision making, and because such decision making itself is subject to CEQA, the analysis of growth inducement effects is not intended to determine site-specific environmental impacts or specific mitigation for the potentially induced growth. Rather, the discussion is intended to disclose the potential for environmental effects to occur more generally, such that decision makers are aware that additional environmental effects are possible if growth-inducing projects are approved. The decision of whether impacts do occur, their extent, and the ability to mitigate them is appropriately left to consideration by the agency responsible for approving such projects, at such times as complete applications for development are submitted.

3.1.4.2 Analysis of Growth Inducement Impacts

Growth rates and patterns are influenced by various local, regional, and national forces that reflect ongoing social, economic, and technological changes. Ultimately, the amount and location of population growth and economic development that occurs in a specific area are controlled largely by local governments through zoning, land use plans and policies, and decisions regarding development applications. Local government and other regional, state, and federal agencies and tribes also make decisions about infrastructure (e.g., roads, water facilities, and sewage facilities) that may influence growth rates and the location of future development.

Transportation infrastructure is one component of the overall infrastructure that may serve to accommodate planned growth. This infrastructure also may serve to hasten or shift planned growth, or to encourage and intensify unplanned growth in an area. Transportation projects may induce growth when they directly or indirectly promote, shift, or intensify planned growth or encourage unplanned growth in a community or region. An example of a growth-inducing transportation project includes construction of a new roadway through an undeveloped area, which could open access to a new area and promote unplanned growth.

To determine the potential for growth-related impacts associated with the project, a first-cut screening was performed in accordance with the *Guidance for Preparers of Growth-Related, Indirect Impact Analyses* (referred to in the remainder of this section as *the Guidance document*) (California Department of Transportation 2006). The interrelated screening factors (accessibility, growth pressure, project type, and project location) discussed in Chapter 5 and summarized in Figure 5-2 of *the Guidance document* were considered. The results of this analysis are detailed below.

- *Does the project have the potential to change accessibility?*

In terms of accessibility, the project would improve accessibility between Sacramento and West Sacramento by replacing the existing I Street Bridge with an improved bridge. The existing I Street Bridge does not comply with current design and traffic operation standards for vehicles, bicycles, or pedestrians. The width of the existing I Street Bridge is not sufficient to provide adequate traffic operations, bicycle lanes, adequate and ADA compliant pedestrian facilities or public transit across the bridge. Improving the bridge and adjacent intersections would improve access throughout the project area, which would benefit the surrounding residents of Sacramento and West Sacramento.

- *Is the project-related growth reasonably foreseeable?*

In terms of growth pressure, the extent to which the project would induce growth in the project area depends largely on the strength of local planning and growth management mechanisms, including adhering to adopted growth boundaries, maintaining existing zoning restrictions and land use designations, and implementing farmland and floodplain protection policies. The Cities of Sacramento and West Sacramento have provided land use designations to guide future growth in the study area; and new development must adhere to these land use designations, per the rules and regulations of the relevant cities. Adherence to these restrictions reduces pressure for unplanned development by making adequate quantities of land available for development in locations that best serve the policy goals of the relevant cities. Given the coordinated growth control mechanisms in place, the project is unlikely to substantially encourage unplanned development in the project area, or to shift or hasten planned growth in the study area. Growth-related impacts of the project related to growth pressure would be minimal to none.

In terms of project type, the project would construct a new two-lane crossing for vehicles to the north of the existing crossing that would connect to Railyards Boulevard instead of I Street on the Sacramento side. The new crossing would include facilities for bicycles and pedestrians. The two-lanes of vehicular travel on the existing bridge would be relocated to the new bridge and the existing I Street Bridge would remain for railroad use only. As described in *the Guidance document,* projects that do not increase roadway capacity are not typically considered likely to cause growth-related impacts.

In terms of project location, the project is located in a built-up urban area. As detailed in *the Guidance document,* transportation projects in urban areas are less likely to cause growth-related impacts because the land uses are generally build-out. Presently, the study area is largely built out. Most of the development planned for the study area is infill such as within the Railyards and Washington Specific Plan areas. The Railyards Specific Plan area is planned for mixed use development. Roadway and other infrastructure in currently under construction. Some vacant parcels in West Sacramento are already planned for future development under the Washington Specific plan. As stated in Chapter 2, growth is expected in the surrounding region. This growth would not be attributable to, or otherwise influenced by, the project.

Based on the first-cut screening analysis detailed above, the project would not be growth-inducing, and further analysis of its potential for growth inducement is not necessary.

3.2 Community Impacts

This section addresses the community impacts of the project, including effects on community character and cohesion, community facilities, relocations, and environmental justice.

3.2.1 Community Character and Cohesion

According to Caltrans guidelines for conducting Community Impact Assessments (California Department of Transportation 2011), *community cohesion* is the degree to which residents have a "sense of belonging" to their neighborhood; a level of commitment of the residents to the community; or a strong attachment to neighbors, groups, or institutions—usually because of

continued association over time. Communities often are delineated by physical barriers such as major roadways or large open space areas.

Cohesive communities are indicated by specific social characteristics such as long average lengths of residency, home ownership, frequent personal contact, ethnic homogeneity, high levels of community activity, and shared goals. Transportation projects may divide cohesive neighborhoods when the projects act as physical barriers or are perceived by residents as psychological barriers. A transportation project perceived as a physical or psychological barrier may isolate one portion of a homogeneous neighborhood.

The study area is divided east/west by the Sacramento River. The Sacramento portion of the study area is further divided by I-5, and due to the urban and industrial nature of the Downtown Sacramento area, this portion of the project area does not possess a high level of community cohesion. The West Sacramento portion of the project area is divided by the UPRR tracks. West Sacramento has more of a small-town sense, and the established neighborhood in the northwest portion of the study area, with associated schools, parks, and facilities makes for a higher level of community cohesion.

The affected roadways in the study area, including I Street in Sacramento and C Street in West Sacramento, serve as primary transportation routes for commuters and patrons of the local businesses and shopping areas. I Street and C Street also serve as a primary transportation route between Sacramento and West Sacramento. During the construction period, roadways would remain open with unrestricted travel during hours of non-construction activities. Travelers may experience delays during periods of active construction that would require temporary lane closures. These delays could discourage some travelers from using these access routes, but lane closures would be temporary, and implementation of the project's Traffic Management Plan (TMP) would ensure that access to adjacent properties would be provided during construction and that delays would be minimized as much as possible.

The project would not construct any new structures or roadways that would significantly alter the divisions already existing in the community or that could further divide existing communities. The connectivity provided by the existing I Street Bridge would be maintained with the new bridge. The transportation infrastructure being constructed in the Railyards Specific Plan area would connect the new bridge location to downtown Sacramento and the access point in West Sacramento would not change. Also, the new bridge would contain bicycle and pedestrian facilities that would improve bicycle and pedestrian connectivity between the cities.

Though traffic patterns would change slightly on local streets there is little potential for cut-through traffic to disrupt existing neighborhoods or community areas. Although the project could cause traffic delays in the study area during active construction periods, cut-through traffic routes that could avoid these delays are not readily available. Thus, no negative effects on community cohesion would be caused by cut-through traffic associated with the project.

3.2.2 Community Facilities

This section addresses the impacts of the project on schools, health care facilities, and alternative transportation in the study area.

3.2.2.1 Schools

The project would not require acquisition or displacement of any school sites in the study area. As discussed in Chapter 2, there are several schools within the study area. However, these schools are not close enough that they would experience temporary noise impacts associated with project construction. It is not anticipated that school bus travel and individual motorist travel to and from local schools would be affected by the project because construction would be concentrated around the new bridge, and residents typically would not be crossing the river to get to/from school, but rather would attend schools in their respective cities.

3.2.2.2 Access, Circulation and Parking

The project would change access and circulation on local roads in the immediate vicinity of the project for motorists, pedestrians, and bicyclists traveling between Sacramento and West Sacramento. Both temporary and permanent changes would occur. During construction, motor vehicles would continue to use the existing facilities in both cities to access the existing I Street Bridge and cross the Sacramento River. In Sacramento, proposed temporary closures of Jibboom Street north of Railyards Boulevard and a temporary access road and detour would be in place for up to 2 years to maintain local access to the Jibboom Street viaduct while the bridge is being built. This temporary change in access and could cause delays, especially when first implemented.

During construction, pedestrians and bicyclists would also continue to use existing facilities in both cities to access the existing I Street Bridge and cross the Sacramento River. A temporary detour of the Sacramento River Parkway trail would be in place for up to 2 years but the connection between the Sacramento River Parkway and the American River Parkway trails would be maintained. Access to the River Walk Park trail south of the existing I Street bridge would not be affected.

Currently, motorists traveling between Sacramento and West Sacramento north of the Tower Bridge cross the Sacramento River on the existing I Street Bridge, which is accessed by I Street in Sacramento and C Street in West Sacramento. With the project, the new I Street Bridge would be accessed from Railyards Boulevard in Sacramento. In West Sacramento, motorists would continue to access the bridge from C Street. Motorists coming from downtown Sacramento would access Railyards Boulevard from 5th Street or other connectors. For motorists traveling from the downtown Sacramento area, this route is less than one mile longer than the current I Street route. For motorists traveling from areas north and northeast of the Railyards property, the new route would be shorter than the current route from I Street.

City of Sacramento Roadway Design Alternatives 1 and 2 would create different intersection experiences at the Railyards Boulevard/Jibboom Street/Bercut Drive intersection (signalized versus roundabout) but would result in only minor operational differences.

In West Sacramento, the roadway changes proposed for the C Street connection to the new bridge would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. City of West Sacramento Residential Access Alternative 1 would construct a new connection to C Street, approximately 150 feet east of the C Street/3rd Street intersection, that would extend north to B Street and then ultimately connect to the 3rd Street/B Street intersection. City of West Sacramento Residential Access Alternative 2 would connect to the same location at C Street as Alternative 1, approximately 150 feet east of the C Street/3rd Street intersection, but would continue north approximately 300 feet, then make a 90-degree left turn, and connect to 3rd Street approximately 300 feet north of C Street. While this would change the local access route, it would not require a substantial detour or change in route (change is less than 500 feet).

The project would modify access and circulation on the two Class I trails that parallel the river by adding trail-to-roadway connections to the new bridge crossing that are not present in the existing bridge design. The Sacramento River Parkway would have a grade separation that would allow users to either pass under the new roadway and new bridge, or continue up to the new roadway and travel either west or east. In West Sacramento, the proposed levee maintenance road would serve as an extension to the Class I River Walk Park trail. Similar to the trail improvements proposed for the Sacramento River Parkway, the trail would be grade-separated under the proposed bridge structure and also provide connections to east- and west-bound C Street from the trail.

Once the new I Street Bridge is in place, the route for pedestrian and bicyclists traveling between the downtown Sacramento area and C Street in West Sacramento would be slightly longer than the current route (approximately 0.2 miles). For pedestrians and bicyclists traveling to and from the area north of the Railyards property, the route would be shorter.

3.2.3 Acquisitions and Relocations

Implementation of the proposed project would require the acquisition of private property, including residences and parkland (parkland impacts are discussed above in section 3.1.3). Project impacts include both full and partial acquisitions, which may displace or alter existing uses. Full acquisition of a property occurs if the entire parcel is within the footprint (right-of-way) of an alternative or if any portion of a building is located within the footprint of the alternative. Full acquisitions also occur when the property is needed for right-of-way or levee fee/easements and results in an uneconomic remnant. Partial acquisition of a property occurs if any part of a parcel is within the footprint (right-of-way) of the alternative but does not require the displacement of the structures on the property. These impacts range from a sliver or edge of a parcel within the proposed right-of-way to substantial portions that fall short of entire displacement. Table 3-2 shows the proposed acquisitions. Because there are no differences in acquisition impacts proposed as part of the City of Sacramento roadway design alternatives, difference in acquisitions needed for the project are broken down by the West Sacramento residential access alternatives.

Table 3-2. Proposed Parcel Acquisitions

Parcel Number	Description	Ownership	Proposed Project with West Sacramento Residential Access Alternative 1* (acres)	Proposed Project with West Sacramento Residential Access Alternative 2* (acres)
002-010-056	Vacant-City of Sacramento	IA Sacramento Development LLC	1.123	1.123
002-010-023	Sacramento River Parkway (Central Area)	State of California	2.155	2.155
001-210-018				
001-019-017	Sacramento River Parkway (Central Area)	City of Sacramento	0.001	0.001
010-103-002	Levee/Broderick Boat Ramp	City of West Sacramento	0.438	0.000
010-103-001	Levee/Broderick Boat Ramp	City of West Sacramento	0.415	0.000
010-102-005	Broderick Boat Ramp	Maryam Asefinejad	0.136	0.136
010-102-004	Vacant Levee-City of West Sacramento	City of West Sacramento	0.182	0.182
010-102-003	Vacant Levee-City of West Sacramento	Larry K. Pancost	0.661	0.661
010-102-002	Vacant Levee-City of West Sacramento	R.B. Investments	0.296	0.296
010-102-010	Vacant Levee/Historic Water Tank	East Yolo Community Services District	1.277	1.277
010-372-003	Vacant Levee-City of West Sacramento	Gail Ann Overhouse	0.667	0.667
010-372-002	Vacant Levee-City of West Sacramento	Gail Ann Overhouse	0.379	0.379
010-101-004	Single-Family Residence	Duran Family Trust	**0.000**	**0.123**
010-101-013	Multi-Family Residence	Arlindo & Maria Alves	**0.153**	**0.031**
010-101-008	Single-Family Residence	Wang Pai Enterprises	0.146	0.146
010-101-009	Single-Family Residence	Wade Steve Thorpe	0.039	0.039
010-101-010	Single-Family Residence	Chambers & Telles	0.036	0.036
010-101-011	Single-Family Residence	Chambers & Telles	0.040	0.040
010-101-012	Vacant-City of West Sacramento	Fong Yue	0.112	0.112
010-371-005	Parking Lot	Redevelopment Agency of City of Sacramento	0.030	0.030
010-371-006	Parking Lot	Redevelopment Agency of City of Sacramento	0.023	0.023
010-482-007	Vacant-City of West Sacramento	Lehrer	0.029	0.029
010-482-008	Vacant-City of West Sacramento	Lehrer	0.015	0.015
010-482-009	Vacant-City of West Sacramento	Lehrer	0.015	0.015

010-482-011	Vacant-City of West Sacramento	Lehrer	0.059	0.059
Source: Mark Thomas and Company 2015. See Appendix A for full parcel acquisition diagrams.				

*There are no differences in acreage impacts as a result of the City of Sacramento roadway design alternatives.

3.2.3.1 Proposed Project with West Sacramento Residential Access Alternative 1

As shown in Table 3-2, construction of the proposed project with West Sacramento Residential Access Alternative 1 would require right-of-way acquisitions from 25 individual parcels and removal a multi-family residence (APN 010-101-013). Acquisition and structure removal on APN 010-101-013 would affect up to four individual apartments. In addition, West Sacramento Residential Access Alternative 1 would require 0.415 more acre of acquisition from Broderick Boat Ramp (parcel 010-103-001) and 0.438 acre from parcel 010-103-002 than West Sacramento Residential Access Alternative 2.

3.2.3.2 Proposed Project with West Sacramento Residential Access Alternative 2

Construction of the proposed project with West Sacramento Residential Access Alternative 2 would require right-of-way acquisition from 23 individual parcels. One individual apartment in the apartment building on APN 010-101-013 would be affected. A single family residence, located on APN 010-101-004, would be removed.

3.2.4 Environmental Justice

The project is being developed in accordance with the Civil Rights Act of 1964, as amended; the Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970, as amended; and Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations). Executive Order 12898 requires each federal agency to take the appropriate and necessary steps to identify and address disproportionately high and adverse human health and environmental effects of its programs, policies, and activities on minority and low-income populations.

Environmental justice refers to the fair treatment of people of all races, cultures, and incomes with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The CEQ's *Environmental Justice: Guidance under the National Environmental Policy Act* (1997) indicates that environmental justice concerns may arise from impacts on the natural or physical environment, such as human health or ecological impacts on minority and low-income populations, or from related social or economic impacts.

For adverse environmental justice effects to result from the project, two conditions need to exist. First, minority or low-income populations need to reside in parts of the study area that would be adversely affected by the project. Second, any adverse impacts would need to fall disproportionately on minority or low-income populations, rather than proportionately on all populations affected by the project.

Once minority and/or low-income populations are identified and an environmental justice analysis is required, a determination must be made as to whether there would be a disproportionately high and adverse effect on human health or the environment. This requires comparing the burdens and benefits that would be experienced by environmental justice populations with the burdens and benefits that would be experienced by non–environmental justice populations. U.S. Department of Transportation Order 5610.2(a) defines a *disproportionately high and adverse effect* as one that would meet either characteristic below.

- The adverse effect would be predominantly borne by a minority and/or low-income population.
- The adverse effect suffered by the minority and/or low-income population would be appreciably more severe than the adverse effect suffered by the non-minority and/or non–low-income population.

An analysis of the project based on these criteria is provided below.

As discussed in more detail in Chapter 2 (Table 2-2), several of the census tracts in the study area have higher percentages of minority populations and low-income populations compared to the rest of Sacramento and West Sacramento. Therefore, an environmental justice evaluation is warranted. The block groups with notably low incomes include CT 07.00 BG 1 and CT 53.01 BG 1 in Sacramento, and CT 101.01 BG 4 in West Sacramento. As shown in Figure 2-2, CT 07.00 BG 1 is located in the Downtown Sacramento/Old Sacramento area. This block group is divided by a major freeway, I-5. There is very little residential development in this block group, and no single-family homes. Residents in this block group would live in high-density residential housing, or temporary housing in motels. There is an apartment building at 5th and I Street that offers senior citizen housing. CT 53.01 BG 1 is located in the northeast portion of the study area and is mainly comprised of industrial land uses, including the Sacramento Railyards. There is very little residential development in this block group. The Dos Rios housing project is located in this block group, but it is located over a mile northeast of the project limits. In CT 101.01 BG 4, there is an established neighborhood in between the UPRR tracks and G Street in West Sacramento. This neighborhood consists of older single family residences as well as multi-family complexes. Most of the residents in the study area are located within CT 101 BG 1 and CT 101 BG 3.

3.2.4.1 Adverse Effects on the Overall Population

The technical reports addressing aesthetics/visual resources, air quality, and noise and vibration indicate that some potential adverse effects are expected to result from the project. The impacts identified in these technical reports and the measures to avoid or reduce them are summarized below.

Aesthetics/Visual Resources

As described in the *Draft Visual Impact Assessment* (ICF International 2015b), the visual degradation resulting from project construction activities would be more noticeable in urban areas adjacent to residences and recreation areas than in industrial and commercial areas. However, construction impacts would be temporary, and construction staging areas would be

restored to preproject conditions after construction is completed. Accordingly, impacts resulting from construction of the project are considered less than significant. Mitigation measures identified in Chapter 4 would reduce construction impacts on aesthetics/visual resources.

The project features would generally appear consistent with similar existing features, and the project would not substantially obstruct long-distance views or substantially alter the existing visual character of the study area. Therefore, impacts resulting from operation of the project are considered less than significant. Mitigation measures listed in the *Draft Visual Impact Assessment* (ICF International 2015b) would reduce operational impacts on aesthetics/visual resources.

Air Quality

Construction of the project would generate dust, diesel fumes, and noise during construction periods. Impacts would be shared proportionally by all residents surrounding the study area, not experienced only by the minority residents. Impacts resulting from construction and operation of the project are considered less than significant. Mitigation measures listed in the *Draft Air Quality Study Report* (Terry A. Hayes Associates 2015) would reduce air quality impacts in the study area.

Noise and Vibration

According to the *Draft Noise Study Report* prepared for this Project (ICF International 2015c), no adverse noise impacts are anticipated during construction because construction would be conducted in accordance with provisions in Section 14-8.02, "Noise Control," of the *Caltrans Standard Specifications* and applicable local noise standards. Construction noise would be short term, intermittent, and typically overshadowed by local traffic noise.

According to the *Draft Noise Study Report*, traffic noise levels would increase by up to 5 dB relative to existing conditions, which would not result in a substantial increase in noise levels. In addition, noise barriers are not feasible throughout the study area, as described in the report. No other mitigation is required.

3.2.4.2 Potential Disproportionate and Adverse Effects on Environmental Justice Populations

Temporary visual effects from construction work would be experienced throughout the study area. These effects would be minor and would be borne equally by all communities along the project alignment. Additionally, construction impacts would be temporary, and construction staging areas would be restored to pre-project conditions after construction is completed. Accordingly, no disproportionately high or adverse effects associated with visual changes, air quality, and noise would be experienced by a minority or low-income population.

Environmental Justice Conclusion

In general, impacts resulting from construction would be most noticeable in the areas closest to the project alignment because construction work would create traffic, noise, and dust. However,

the impacts borne by the environmental justice populations of the study area would be similar to and no greater than impacts borne by all populations within the study area. As stated above, minority and low income populations are located in pockets and are not pervasive throughout the study area. Most of the residents in the study area are located in CT 101 BG 1 and CT 101 BG 3, which have incomes more comparable to the respective cities.

For the reasons above and in consideration of the benefits that the project would provide to *all* the minority and low-income residents of the study area by increasing access, the proposed project is not considered to cause disproportionately high and adverse human health and environmental effects on minority and low-income residents of the study area.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have been included in this project. Caltrans' commitment to upholding the mandates of Title VI is evidenced by its Title VI Policy Statement, signed by the Director.

3.3 Emergency Services and Utilities

This section addresses the impacts of the project on emergency services, including police, fire protection, and emergency medical services, and on utilities and communications providers.

3.3.1 Police, Fire Protection, and Emergency Medical Services

It is expected that public facilities and emergency service centers in the project vicinity would be minimally affected during construction because the existing I Street Bridge would remain open and functional during construction. During construction, short-term lane closures would be necessary on local streets, as described above in section 3.2.2.3. The following emergency service providers would be notified by the lead agency prior to any road closures.

- Sacramento County Sheriff Department
- Yolo County Sheriff Department
- City of Sacramento Police Department
- City of West Sacramento Police Department
- City of Sacramento Fire Department
- City of West Sacramento Fire Department
- California Highway Patrol
- American Medical Response

As stated in Section 3.2.2.3, access and circulation would change in the study area. Depending on what direction the emergency service is driving to or from, the route could be shorter, or up to about one mile longer. Implementation of a TMP would ensure that construction would not create major delays for emergency service providers. In addition, emergency service providers

would be notified as early as possible in order to plan for lane closures and other delays related to construction activity.

3.3.2 Utilities, Public Services and Communication Providers

A number of public and private utilities would need to be relocated or adjusted to grade as part of the project, including existing water, sewer, gas, electric, and communication facilities within Jibboom Street, Bercut Drive, C Street, and 2nd Street.

Notifying and coordinating with utility providers would ensure that potentially affected utility customers are notified of potential service disruptions before they occur.

3.4 Economic Impacts

3.4.1 Construction-Related Economic Impacts

Construction of the proposed project would have temporary economic effects in the local area and region. One temporary effect would be an increase in economic activity due to project-related spending, including purchases of goods and services required for construction and employment of workers needed for construction. The increased economic activity would prompt secondary economic activity as a portion of the construction-related revenue, and employee compensation is re-spent in sectors throughout the local and regional economy. The extent of the economic impact of construction-related expenditures on the local and regional economy would depend on the proportion of construction expenditures that would occur in the local and regional area and on the residential location of persons employed by construction contractors.

3.4.2 Operation-Related Economic Impacts

It is expected that relocations would take place within the city of West Sacramento, and therefore no impacts to the taxable value of the property in this city is anticipated. The function of the bridge would be to improve local connectivity. It is intended to improve access to local businesses, recreation areas, and new development/redevelopment sites located in the urban core of Sacramento and West Sacramento. Therefore, by improving access and connectivity in the study area, the proposed project is expected to indirectly result in an increase in the taxable value of land in both cities.

3.5 Cumulative Impacts

For purposes of this CIA, cumulative impacts on resources in the general project vicinity may result from closely related projects that add incrementally to the impacts of the proposed project.

Other development projects, such as the Railyards, Township 9, The Bridge District and development along the waterfront in both cities are currently planned and some are under construction. If these projects are constructed concurrently with the proposed project, potentially considerable cumulative impacts could result in traffic delays to motorists, including emergency service providers. However, including a TMP and providing early notification of service providers would reduce these impacts to less than cumulatively considerable levels.

Chapter 4 Avoidance, Minimization, and/or Mitigation Measures

4.1 Measures to Reduce Land Use Impacts

In addition to the measures in the TMP, the following measures are proposed to reduce the adverse socioeconomic impacts that could result from the project. These measures would apply to the proposed project and the design alternatives.

4.1.1 Conflicts with Existing and Planned Land Uses

No potential conflicts with current planned land uses in the study area are anticipated. Therefore, no measures to reduce impacts are proposed.

4.1.2 Direct and Indirect Land Use Impacts

Air quality and aesthetic mitigation and abatement measures should be implemented to reduce the direct and indirect land use impacts of the project. The following measures are from the Air Quality Study Report (Terry A. Hayes Associates 2015), and Visual Impact Report (ICF International 2015c) prepared for the project.

Air Quality Mitigation

- The contractor shall obtain all necessary Sacramento County and Yolo County permits and approvals and shall follow all required County laws and procedures and respect to best management practices, grading and excavation for the proposed project and all construction-related and emission-generating activities.
- Construction of the project shall comply with Sacramento Metropolitan Air Quality Management District (SMAQMD) and Yolo-Solano Air Quality Management District (YSAQMD) Basic Construction Emission Control Practices, Exhaust Control Practices, and Fugitive PM Dust Control Practices.
- Construction activity within The Railyards Specific Plan area shall comply with the mitigation measures contained in the adopted Mitigation Monitoring and Reporting Plan for The Railyards development (City of Sacramento 2007).

Visual Impact Mitigation

- Work with Stakeholders to Determine Bridge Aesthetics. The project proponent will conduct a focused outreach effort and will conduct a public meeting or charrette session with public stakeholders to develop an aesthetic design approach to aid in reducing the visual impact of the proposed bridge. This measure will allow concerned viewers to aid in creating a bridge that is visually appealing to the general public, while balancing the need for increased

circulation access at this location. Affected stakeholders will be able to provide input on the preferred architectural style and coloring of the proposed bridge.

- Implement Project Landscaping. The project proponent will install landscaping where space and safety considerations allow. This will improve the visual quality of the project corridor by improving corridor aesthetics and helping to reduce the apparent scale of new and reconfigured intersections, in addition to replacing some of the vegetation lost through construction. Prior to approval of the roadway design, the City of Sacramento and /or City of West Sacramento project landscape architect will review project designs to ensure that the following elements are implemented in the project landscaping plan.
  - Design and implement low impact development (LID) measures that disperse and reduce runoff by using such features as vegetated buffer strips/medians between paved areas that catch and infiltrate runoff. In addition, pervious paving will be evaluated for use in the proposed project to improve infiltration and to reduce the amount of surface runoff from entering waterways and the storm water system. LID measures will not be used where infiltration could result in adverse environmental effects. LID measures, such as cobbled swales and aggregate mulching, can be used as an aesthetic design element to create an attractive view while reducing water use.
  - Require construction contractors to incorporate native grass and wildflower seed to standard seed mixes, which may be non-native, for erosion control measures that will be applied to all exposed slopes. Wildflowers will provide seasonal interest to areas where trees and shrubs are removed and grasslands are disturbed. Only wildflower and grass species that are native will be incorporated into the seed mix, and under no circumstances will any invasive grass or wildflower plant species be used as any component in any erosion control measures. Species will be chosen that are indigenous to the area and for their appropriateness to the surrounding habitat. For example, upland grass and wildflower species will be chosen for drier, upland areas, and wetter species will be chosen for areas that will receive more moisture. If not appropriate to the surrounding habitat, wildflowers should not be included in the seed mix.
  - Require the species list to include trees, shrubs, and an herbaceous understory of varying heights, as well as both evergreen and deciduous types. Plant variety will increase the effectiveness of the roadside planting areas by providing multiple layers, seasonality, diverse habitat, and reduced susceptibility to disease. Evergreen groundcovers or low-growing plants, such as *Ceanothus* spp., should be used in areas where taller vegetation would potentially cause driving hazards by obscuring site distances. Species used will be native and indigenous to the project area and California. Native plant species can be used to create attractive spaces, high in aesthetic quality, that are not only drought-tolerant but also attract more wildlife than traditional landscape plant palettes. Use of native species promotes a visual character of California that is being lost through development and reliance on non-native ornamental plant species.
  - Use vegetative accents and screening to reduce the perceived scale and mass of the built features, while accentuating the design treatments that will be applied to built features. Special attention should be paid to plant choices near residences to ensure that species chosen are of an appropriate height and rely on evergreen species to provide year-round light screening from nuisance light, if applicable.

  - Under no circumstances will any invasive plant species be used at any location.
  - Plant vegetation within the first 6 months following project completion.
  - Implement an irrigation and maintenance program during the plant establishment period and carried on, as needed, to ensure plant survival. However, design of the landscaping plan will try to maximize the use of planting zones that are water efficient. The design also may incorporate aesthetic features, such as cobbling swales or shallow detention areas, which can reduce or eliminate the need for irrigation in certain areas.
  - If an irrigation system is required, use a smart watering system in areas that are irrigated to evaluate the existing site conditions and plant material against weather conditions to avoid overwatering of such areas. To avoid undue water flows, manage the irrigation system in such a manner that any broken spray heads, pipes, or other components are fixed within 1–2 days, or the zone or system will be shut down until it can be repaired.

- Apply Minimum Lighting Standards. All artificial outdoor lighting and overhead street lighting is to be limited to safety and security requirements and the minimum required for driver safety. Lighting will be designed using Illuminating Engineering Society's design guidelines and in compliance with International Dark-Sky Association–approved fixtures. All lighting will be designed to have minimum impact on the surrounding environment and will use downcast, cut-off type fixtures that are shielded and direct the light only toward objects requiring illumination. Therefore, lights will be installed at the lowest allowable height and cast low-angle illumination while minimizing incidental light spill onto adjacent properties or open spaces, or backscatter into the nighttime sky. The lowest allowable wattage will be used for all lighted areas, and the amount of nighttime lights needed to light an area will be minimized to the highest degree possible. Light fixtures will have non-glare finishes that will not cause reflective daytime glare. Lighting will be designed for energy efficiency, with daylight sensors or timers with an on/off program. Lights will provide good color rendering with natural light qualities, with the minimum intensity feasible for security, safety, and personnel access. Lighting, including light color rendering and fixture types, will be designed to be aesthetically pleasing.

  LED lighting will avoid the use of blue-rich white light lamps and use a correlated color temperature that is no higher than 3,000 Kelvin, consistent with the International Dark-Sky Associations Fixture Seal of Approval Program (International Dark-Sky Association 2010a, 2010b, 2015). In addition, LED lights will use shielding to ensure that nuisance glare and that light spill does not affect sensitive residential viewers.

  Lights along pathways and bridge safety lighting will use shielding to minimize offsite light spill and glare, and will be screened and directed away from adjacent uses to the highest degree possible. The amount of nighttime lights used along pathways will be minimized to the highest degree possible to ensure that spaces are not unnecessarily over-lit. For example, the amount of light can be reduced by limiting the amount of ornamental light posts to higher use areas and by using bollard lighting on travel way portions of pathways.

  Technologies to reduce light pollution evolve over time; design measures that are currently available may help but may not be the most effective means of controlling light pollution once the project is designed. Therefore, all design measures used to reduce light pollution

will use the technologies available at the time of project design to allow for the highest potential reduction in light pollution.

4.1.3 Impacts on Park Facilities

The following mitigation measures should be implemented to reduce impacts on park and recreational facilities due to construction.

- In the event that any inadvertent damage occurs to the Sacramento Riverwalk Trail, the area affected will be restored to the condition that existed prior to construction activities or better.
- The City of Sacramento will provide advance notification of the Sacramento Riverwalk Trail closure on its websites and trailheads. Notices will include trail closure dates, approximate duration, and description of the detour available during closure.

4.2 Measures to Reduce Growth Inducement Impacts

The project is not anticipated to induce growth. Therefore, no measures to reduce impacts are proposed.

4.3 Measures to Reduce Social Impacts

4.3.1 Community Cohesion Effects

The community cohesion impacts of the project are anticipated to be minor. Therefore, no measures to reduce impacts are proposed.

4.3.2 Access and Circulation Impacts

A TMP is a program of activities for alleviating or minimizing work-related traffic delays by applying traditional traffic handling practices and innovative strategies including public awareness campaigns, motorist information, demand management, incident management, system management, construction methods and staging, and alternate route planning. TMP strategies also strive to reduce overall duration of work activities where appropriate. Typical components of a TMP can include measures such as the implementation of staging, traffic handling, and detour plans; restricting construction work to certain days and/or hours to minimize impacts to traffic and pedestrians; coordination with other construction projects to avoid conflicts; and the use of portable changeable message signs to inform the public of construction activities.

Implementation of the measures in the TMP would reduce the temporary access and circulation impacts of the project caused by potentially lengthy construction delays. In addition to the measures described above, the TMP will include the following measures:

- Any emergency service agency whose ability to respond to incidents will be affected by any lane closure must be notified prior to that closure.
- Work will be coordinated with the local busing system (including school buses and public systems) to minimize impacts on their bus schedules.
- The lead agency will provide information to residents and businesses before and during project work that may represent a negative impact on commerce and travel surrounding the zone of construction.

4.3.3 Emergency Services Impacts

Implementation of the TMP would reduce potential impacts on the response times of emergency service providers (including law enforcement, fire protection, and ambulance service providers) caused by potential construction delays. Therefore, no additional measures to reduce impacts are proposed.

4.3.4 Effects on Utilities, Public Services and Communications Providers

Early notification of utility service and communications providers would help to ensure that patrons are notified prior to any temporary loss of service.

4.3.5 Environmental Justice Effects

No environmental justice effects are anticipated to result from the project. Therefore, no measures to reduce impacts are proposed.

4.4 Measures to Reduce Acquisition/Displacement/Relocation Impacts

As stated in Chapter 3, there would be acquisition required from several parcels in the project area for new right-of-way. No businesses would be displaced as a result of the project. Acquisitions and compensation to residential property owners would occur consistent with the Federal Uniform Relocation Assistance and Real Properties Acquisition Policies Act, as amended.

4.5 Measures to Reduce Economic Impacts

4.5.1.1 Economic Effects on Businesses from Construction Delays and Road Closures

Business notification measures included in the TMP for the project would reduce potential effects on local businesses from construction delays. Therefore, no measures to reduce impacts are proposed.

4.5.1.2 Economic Effects on Businesses from Construction

The construction-related economic effects of the project are anticipated to be beneficial. Therefore, no measures to reduce impacts are proposed.

4.5.1.3 Temporary Effects on Local Tax Revenue

The local tax revenue effects of the proposed project are anticipated to be minor. Therefore, no measures to reduce impacts are proposed.

4.6 Measures to Reduce Cumulative Impacts

Implementation of measures above recommended for the project would reduce the cumulative impacts of the project. No additional impact-reducing measures are proposed.

Chapter 5 References

5.1 Printed References

California Department of Transportation. 2006. *Guidance for Preparers of Growth-Related Indirect Impact Analysis*. May. Sacramento, CA. Available: http://www.dot.ca.gov/ser/Growth-related_IndirectImpactAnalysis/gri_guidance.htm. Accessed: July 2, 2015.

California Department of Transportation. 2011. *Community Impact Assessment, Caltrans Standard Environmental Reference, Environmental Handbook 4*. October 2011. Available: http://www.dot.ca.gov/ser/vol4/downloads/vol4_entire.pdf. Accessed: July 2, 2015.

Sacramento City-County Task Force. 2011. *The 2010 Sacramento City/County Bikeway Master Plan*. Adopted by Sacramento County November 23, 1993 and adopted by the City of Sacramento on April 11, 1995. Last Updated March 2011. Sacramento, California.

City of Sacramento Fire Department 2012

City of Sacramento Police Department 2012

City of Sacramento. 1997. Sacramento River Parkway Plan. Available: http://www.sacramentoriverparkway.org/The_Parkway_Story/Sac-River-Parkway-Plan.1997.pdf. Accessed June 22, 2015.

City of Sacramento. 2006. City of Sacramento Pedestrian Master Plan. Available: http://portal.cityofsacramento.org/Public-Works/Transportation/Programs-and-Services/Pedestrian-Program. Accessed July 31, 2015.

City of Sacramento. 2007. Sacramento Railyards Specific Plan. Sacramento, California.

City of Sacramento. 2011. River District Specific Plan. Community Development Department and Economic Development Department. Sacramento, California.

City of Sacramento. 2013. City of Sacramento Capitol Improvement Program 2013–2018. Available: http://portal.cityofsacramento.org/Finance/Budget/Documents/ApprovedCIP

City of Sacramento. 2015. Sacramento 2035 General Plan. Adopted March 3, 2015. Sacramento, California.

City of West Sacramento. 1996. Washington Specific Plan. West Sacramento, California. Available: https://www.cityofwestsacramento.org/civica/filebank/blobdload.asp?BlobID=3639. Accessed July 31, 2015.

City of West Sacramento. 2000. General Plan Policy Document. Available: https://www.cityofwestsacramento.org/civica/filebank/blobdload.asp?BlobID=3615.

City of West Sacramento. 2012. City Profile, Census Bureau. Available: https://www.cityofwestsacramento.org/documents/WSEconProfile092013Rev2.pdf. Accessed: July 2, 2015.

City of West Sacramento. 2013. West Sacramento Bicycle, Pedestrian, and Trails Master Plan. Available: http://www.cityofwestsacramento.org/city/depts/pw/traffic_n_transportation/alternative_transportation/bicycling.asp. Accessed July 31, 2015.

Council on Environmental Quality. 1997. *Environmental Justice: Guidance under the National Environmental Policy Act*. December 10, 1997. Available; http://www.epa.gov/environmentaljustice/resources/policy/. Accessed July 2, 2015.

Federal Highway Administration. 1996. *Community Impact Assessment: A Quick Guide for Transportation*. September. Available: https://www.environment.fhwa.dot.gov/projdev/tdmcia.asp. Accessed October 31, 2014.

Fehr & Peers. 2013 West Sacramento Bicycle, Pedestrian, and Trails Master Plan. Prepared for the City of West Sacramento.

ICF International 2015a. *Draft Section 4(f) Report for the I Street Bridge Replacement Project.* August 2015.

ICF International 2015b *Visual Impact Assessment for the I Street Bridge Replacement Project*. July 2015.

ICF International 2015c. *Noise Study Report for the I Street Bridge Replacement Project*. June 2015.

International Dark-Sky Association. 2010a. Seeing Blue. April. *Nightscape 80*: 8-12. Available: <http://www.darksky.org/assets/documents/SeeingBlue.pdf>. Accessed: June 14, 2015.

———. 2010b. *Visibility, Environmental, and Astronomical Issues Associated with Blue-Rich White Outdoor Lighting*. Available: http://www.darksky.org/assets/documents/Reports/IDA-Blue-Rich-Light-White-Paper.pdf. Document date: May 4, 2010. Accessed: June 14, 2015.

———. 2015. IDA Issues New Standards on Blue Light at Night. April. *Nightscape 94*: 10. Available: <http://www.darksky.org/assets/documents/Nightscape/IDA_April2015_LowRes.pdf>. Accessed: June 14, 2015.

Mintier Harnish. 2009. City of West Sacramento General Plan Background Report. Available: https://www.cityofwestsacramento.org/generalplan2030/pdf/wsgpu_br_2landuse.pdf. Accessed June 2015.

Pacific Gas and Electric Company 2015. Company Profile. Available: http://www.pge.com/en/about/company/profile/index.page**.** Accessed August 4, 2015.

Sacramento City-County Bikeway Task Force. 2010. 2010 Sacramento City/County Bikeway Master Plan. Available: http://portal.cityofsacramento.org/~/media/Corporate/Files/Public-Works/Publications/Transportation/Bicycle-Pedestrian/BMP-Final.pdf. Accessed July 31, 2015.

Sacramento Metropolitan Fire District. 2015. About us. Available: http://www.metrofire.ca.gov/index.php/about-us. Accessed July 31, 2015.

Sacramento Municipal Utilities District 2015. SMUD 2014 Annual Report, Sacramento Rising. Available: https://www.smud.org/en/about-smud/company-information/documents/2014-annual-report.pdf. Accessed August 4, 2015.

Terry A. Hayes Associates. 2015. Draft I Street Bridge Replacement Project Air Quality Study Report.

U.S. Census Bureau. 2010. *2010 Demographic Profile Data*. Available: <http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t#none>. Accessed: June 2015.

Appendix A Right of Way Acquisition

LEGEND

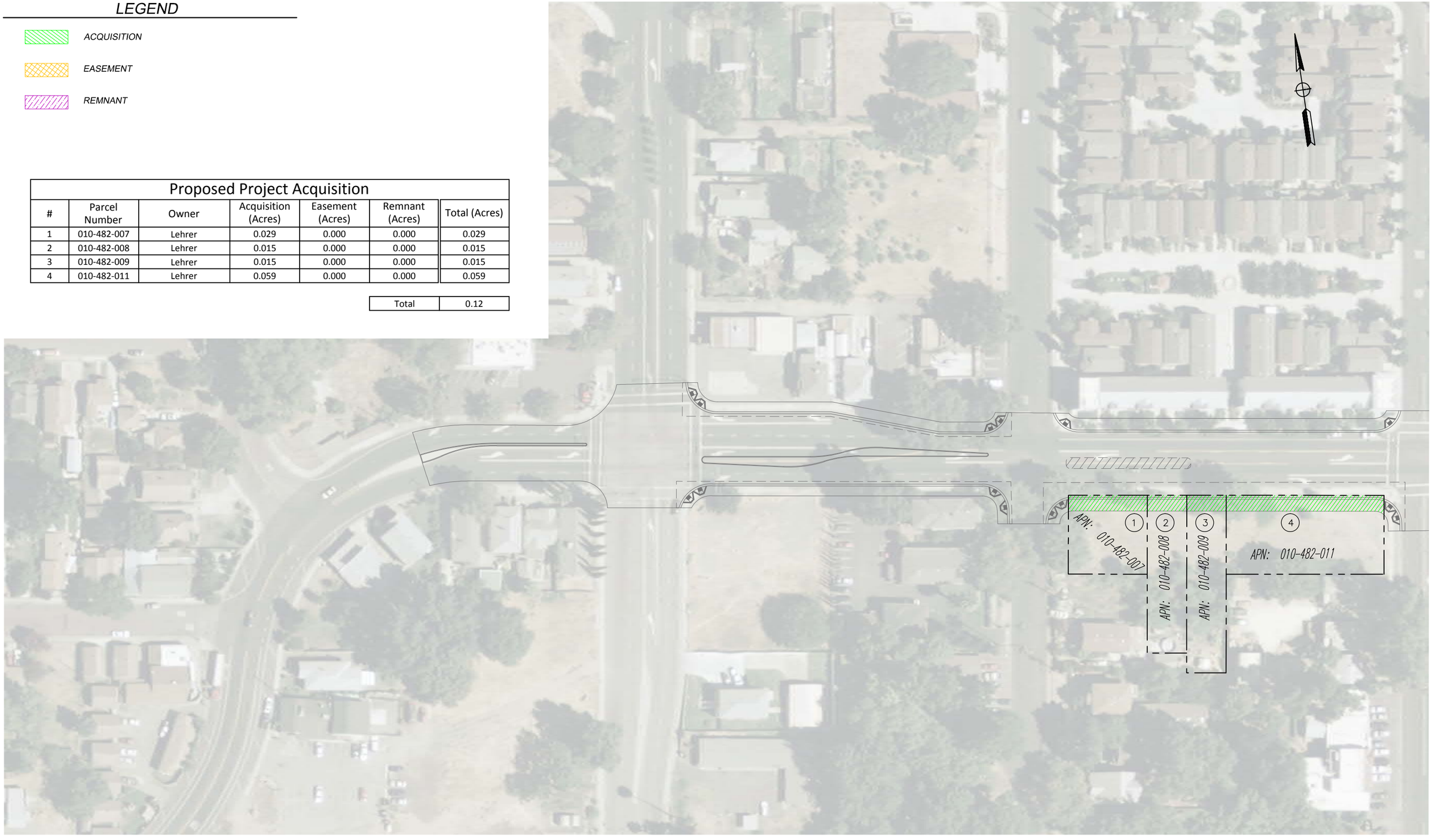
ACQUISITION

EASEMENT

REMNANT

Proposed Project Acquisition						
#	Parcel Number	Owner	Acquisition (Acres)	Easement (Acres)	Remnant (Acres)	Total (Acres)
1	010-482-007	Lehrer	0.029	0.000	0.000	0.029
2	010-482-008	Lehrer	0.015	0.000	0.000	0.015
3	010-482-009	Lehrer	0.015	0.000	0.000	0.015
4	010-482-011	Lehrer	0.059	0.000	0.000	0.059

Total	0.12



I STREET BRIDGE REPLACEMENT

RIGHT OF WAY ACQUISITION

MARK THOMAS & COMPANY
Providing Engineering, Surveying & Planning Services
7300 FOLSOM BOULEVARD, SUITE 203
SACRAMENTO, CALIFORNIA 95826
(916) 381-9100

LEGEND

ACQUISITION

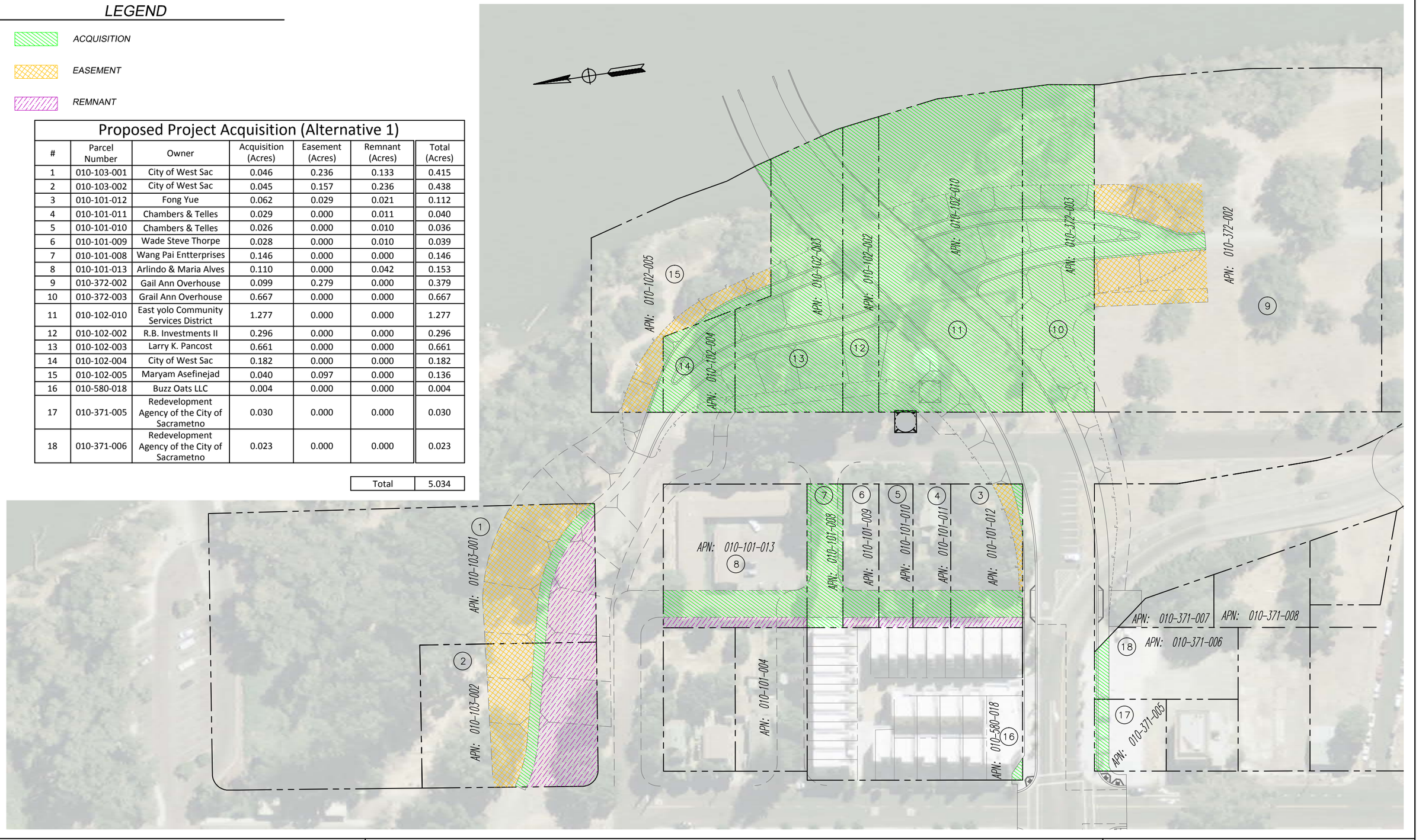
EASEMENT

REMNANT

Proposed Project Acquisition (Alternative 1)

#	Parcel Number	Owner	Acquisition (Acres)	Easement (Acres)	Remnant (Acres)	Total (Acres)
1	010-103-001	City of West Sac	0.046	0.236	0.133	0.415
2	010-103-002	City of West Sac	0.045	0.157	0.236	0.438
3	010-101-012	Fong Yue	0.062	0.029	0.021	0.112
4	010-101-011	Chambers & Telles	0.029	0.000	0.011	0.040
5	010-101-010	Chambers & Telles	0.026	0.000	0.010	0.036
6	010-101-009	Wade Steve Thorpe	0.028	0.000	0.010	0.039
7	010-101-008	Wang Pai Entterprises	0.146	0.000	0.000	0.146
8	010-101-013	Arlindo & Maria Alves	0.110	0.000	0.042	0.153
9	010-372-002	Gail Ann Overhouse	0.099	0.279	0.000	0.379
10	010-372-003	Grail Ann Overhouse	0.667	0.000	0.000	0.667
11	010-102-010	East yolo Community Services District	1.277	0.000	0.000	1.277
12	010-102-002	R.B. Investments II	0.296	0.000	0.000	0.296
13	010-102-003	Larry K. Pancost	0.661	0.000	0.000	0.661
14	010-102-004	City of West Sac	0.182	0.000	0.000	0.182
15	010-102-005	Maryam Asefinejad	0.040	0.097	0.000	0.136
16	010-580-018	Buzz Oats LLC	0.004	0.000	0.000	0.004
17	010-371-005	Redevelopment Agency of the City of Sacrametno	0.030	0.000	0.000	0.030
18	010-371-006	Redevelopment Agency of the City of Sacrametno	0.023	0.000	0.000	0.023

Total	5.034



I STREET BRIDGE REPLACEMENT

RIGHT OF WAY ACQUISITION (ALTERNATIVE 1)

MARK THOMAS & COMPANY
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(916) 381-9100

LEGEND

ACQUISITION

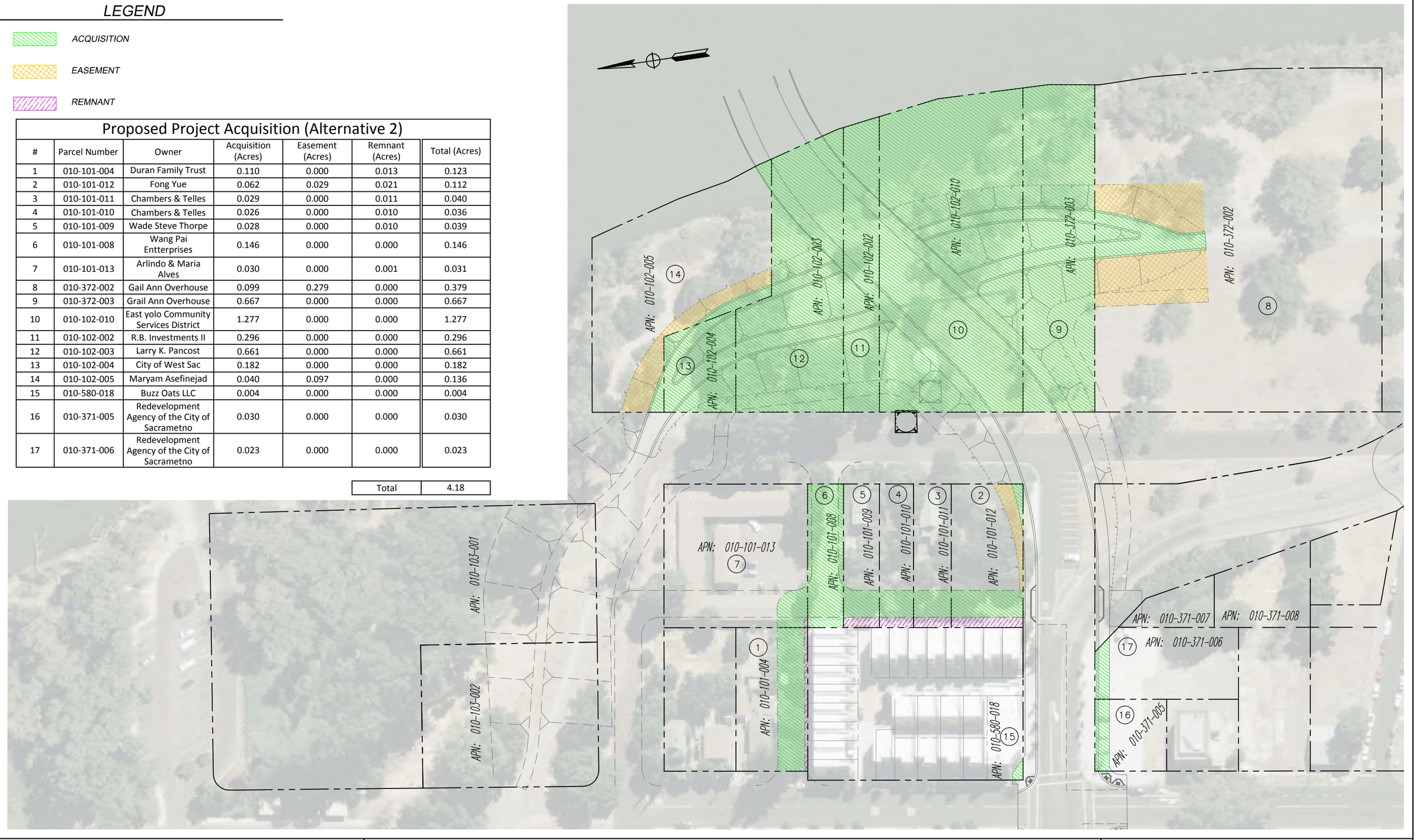
EASEMENT

REMNANT

Proposed Project Acquisition (Alternative 2)

#	Parcel Number	Owner	Acquisition (Acres)	Easement (Acres)	Remnant (Acres)	Total (Acres)
1	010-101-004	Duran Family Trust	0.110	0.000	0.013	0.123
2	010-101-012	Fong Yue	0.062	0.029	0.021	0.112
3	010-101-011	Chambers & Telles	0.029	0.000	0.011	0.040
4	010-101-010	Chambers & Telles	0.026	0.000	0.010	0.036
5	010-101-009	Wade Steve Thorpe	0.028	0.000	0.010	0.039
6	010-101-008	Wang Pai Entterprises	0.146	0.000	0.000	0.146
7	010-101-013	Arlindo & Maria Alves	0.030	0.000	0.001	0.031
8	010-372-002	Gail Ann Overhouse	0.099	0.279	0.000	0.379
9	010-372-003	Grail Ann Overhouse	0.667	0.000	0.000	0.667
10	010-102-010	East yolo Community Services District	1.277	0.000	0.000	1.277
11	010-102-002	R.B. Investments II	0.296	0.000	0.000	0.296
12	010-102-003	Larry K. Pancost	0.661	0.000	0.000	0.661
13	010-102-004	City of West Sac	0.182	0.000	0.000	0.182
14	010-102-005	Maryam Asefinejad	0.040	0.097	0.000	0.136
15	010-580-018	Buzz Oats LLC	0.004	0.000	0.000	0.004
16	010-371-005	Redevelopment Agency of the City of Sacrametno	0.030	0.000	0.000	0.030
17	010-371-006	Redevelopment Agency of the City of Sacrametno	0.023	0.000	0.000	0.023

Total	4.18



I STREET BRIDGE REPLACEMENT

RIGHT OF WAY ACQUISITION (ALTERNATIVE 2)

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(916) 381-9100

LEGEND

- ACQUISITION
- EASEMENT
- REMNANT

Proposed Project Acquisition (Sacrmento)						
#	Parcel Number	Owner	Acquisition (Acres)	Easement (Acres)	Remnant (Acres)	Total (Acres)
1	002-010-056	IA Sacramento Development LLC	0.570	0.553	0.000	1.123
2	002-010-023	State Of California	2.155	0.000	0.000	2.155
3	001-210-018					
4	001-019-017	City of Sacramento	0.001	0.000	0.000	0.001
5	001-019-007	City of Sacramento	0.000	0.000	0.000	0.000
6	001-019-008	City of Sacramento	0.000	0.000	0.000	0.000

Total	3.28

I STREET BRIDGE REP[LACEMENT

RIGHT OF WAY ACQUISITION

MARK THOMAS & COMPANY
Providing Engineering, Surveying & Planning Services
7300 FOLSOM BOULEVARD, SUITE 203
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Preliminary
Geotechnical and Foundation Report
I Street Bridge Replacement
Sacramento, California

REPLACEMENT OF THE I STREET BRIDGE

Submitted to:

Mark Thomas and Company
7300 Folsom Blvd, Suite 203
Sacramento, CA 95826

Prepared By:

GEI Consultants, Inc.
2868 Prospect Park Drive, Suite 400
Rancho Cordova, California 95670

August 2014

Contract Number SA-14108

GEI Consultants

Geotechnical
Environmental
Water Resources
Ecological

Preliminary Geotechnical and Foundation Report for the

I Street Bridge Replacement Project

Sacramento, California

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Sacramento, CA 95826

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Rancho Cordova, California 95670

August 2014

Contract No. SA-14108

Report was prepared under the direction of:

Richard Sanchez, P.E.
Engineering Manager

By: Mark Freitas, P.E.
Madison Weber, P.E.
Ian Maki, P.E.

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1. Introduction

1.1 Purpose and Scope

The I Street Bridge Replacement Project consists of the planning, design and construction of a new bridge across the Sacramento River between the City of Sacramento, Sacramento County, California and the City of West Sacramento, Yolo County, California. GEI Consultants (GEI), under subcontract to Mark Thomas and Company has prepared this Preliminary Geotechnical and Foundation Report, in accordance with Caltrans guidelines, to assist in the preliminary design of the I Street Bridge Replacement Project. We prepared this report as outlined in our agreement dated March 19, 2014 between GEI and Mark Thomas and Company. Our authorized scope of services includes the following:

- Reviewing existing subsurface data and foundation plans for bridges and structures in the project vicinity;
- Preparing a vicinity map and exploration location map with pertinent geology, including the approximate location of previous explorations performed by others;
- Evaluating the geologic and seismic setting of the site
- Evaluating the subsurface conditions including estimates of groundwater level and possible seasonal variations in the level;
- Evaluating conceptual foundation types including depths of foundations;
- Evaluating the bridge foundation / levee impacts and potential modifications, as applicable, and;
- Providing recommendations for geotechnical studies for final design.

This report was prepared for the exclusive use of Mark Thomas and Company and their consultants for design of this project. In the event that any changes are made in the character, design or layout of the project, we must be contacted to review the conclusions and recommendations contained in this report to determine whether modifications are necessary.

1.2 Project Location

The project location is shown in Appendix I, Figure 1, the Site and Exploration Location Plan. The new I Street Bridge will cross the Sacramento River between the former railyard in Sacramento and the City of West Sacramento. Figure 1 includes the proposed bridge alignments and the approximate location of available historic explorations.

1.3 Project Description

The cities of Sacramento and West Sacramento have proposed the replacement of the I Street Bridge. The existing I Street Bridge is a steel double-decker swing bridge. The upper deck

is a two lane roadway for vehicular traffic with narrow sidewalks for pedestrians, and the lower deck is for railroad use. The existing bridge will remain in place for railroad purposes. The new moveable bridge will be located north of the existing bridge and will cross approximately from the existing connector in West Sacramento to either Railyards Boulevard or Camille Lane in Sacramento. At the time of this report, (May 2014) the final alignment and type of bridge are still being formulated.

2. Data Review

2.1 Data Collection and Review

GEI reviewed the following existing information and files that was provided in electronic format:

1. Phase 1 Geotechnical Data Report (P1GDR) for the Sacramento River Study Area, prepared by URS, GEI Consultants, and Fugro, November 2008.

2. Supplemental Geotechnical Data Report (SGDR) for the Sacramento River Study Area, prepared by URS, GEI Consultants, and Fugro, September 2011.

3. Final Geotechnical Report for the 5th Street North of UPRR as part of the Railyards Boulevard Improvements Project, prepared by Blackburn Consulting, July 2010.

4. Memorandum of Understanding Respecting the Sacramento River Flood Control Project, USACE, November 6, 1953

5. West End Viaduct As-Built Plans, prepared by State of California, Highway Transportation Agency, dated December 1966.

6. Geotechnical Evaluation Report (GER) Volume 1, Existing Conditions for the West Sacramento Study Area prepared by URS, GEI Consultants, and Fugro, November 2012.

7. Phase 1 Geotechnical Data Report (P1GDR) for the West Sacramento River Study Area, prepared by URS, GEI Consultants, and Fugro, August 2008.

2.2 Explorations and Testing

No project-specific field explorations were performed by GEI in performance of our geotechnical study for the project. Subsurface data from the logs of historic borings provided in the reference documents were used to develop the preliminary stratigraphy and site characterization estimated in this report. The available explorations within approximately 1,000 feet of the planned bridge alignments included 15 exploratory borings and 6 cone penetration tests (CPT). No site specific laboratory strength tests are available within the project vicinity. The logs provided standard penetration test blow counts (SPT) and limited index testing. This information along with the CPT data were used to develop soil strength and consistency

For final design of the project, additional field exploration including CPTs and borings will be necessary to develop final geotechnical engineering properties, and design criteria for bridge foundations, project retaining wall, earthwork, and pavement design. GEI recommends performing additional field work and laboratory testing as described in Section 4.5 – Additional Field Work and Laboratory Testing.

2.3 Mapping

The base topographic map used for the project has been developed from a light detection and ranging (LiDAR) and bathymetry survey developed for ULE. ULE LiDAR data was collected in 2007 along a limited swath along the Sacramento River, typically covering from the levee to the river water surface and approximately 300 feet to the landside of the levee. The ULE survey report indicates the data was collected with vertical accuracy of 4 inches and horizontal accuracy of 6 inches. The ULE bathymetric survey of the Sacramento River was performed between November 2007 and January 2008. The ULE LiDAR data and bathymetric survey were compiled into one GIS format dataset and was provided to GEI by DWR. Landward of the available ULE LiDAR data, additional topographic information is available from DWR's Central Valley Floodplain Evaluation and Delineation (CVFED) LiDAR collected between October 2008 and February 2009. Metadata available with the CVFED LiDAR indicates the data meets the 3.5 feet horizontal accuracy standard at the 95% confidence level and post processed LiDAR elevations have been tested to 4-inch vertical accuracy at 95 percent confidence level. CVFED LiDAR is not displayed in the site plan maps (Plates 1 to 41) but was used to develop the analysis cross sections where they extend beyond the coverage of the ULE LiDAR.

2.4 Existing Structures

The eastern end of the proposed bridge alignments are adjacent to the existing West End Viaduct, and Jibboom Street Viaduct, and near Interstate 5. Previous exploratory boring logs are available for West End Viaduct, but no existing as-built foundation information was available for this review. In addition, no existing as-built foundation information of Interstate 5 was available for this review.

The Jibboom Street viaduct and bridge as-builts are available for this review. The Jibboom Street Bridge spans the American River approximately 3,000 feet north of the planned I Street Replacement Bridge alignments. The Jibboom Street Bridge consists of 5 piers (three piers within the river and one on each abutment). The pile plan shows pile groups with 23 piles spaced at 5.5 feet with the bridge bents. The pile cap is at elevation -10.0 and the bottom of pile at elevation -50.0. The Jibboom Street viaduct as-builts contain limited discernable information, but the details suggest pile spacing of 3 feet within the pile groups supporting the viaduct footings. Viaduct footing pile depths are unknown. The design pile capacity of the Jibboom Street Bridge and Viaduct are unknown.

Other features in vicinity to the planned bridge alignments include two existing 30-inch abandoned waterlines and one active existing 42-inch water line exist running within the east levee embankment. One 12-inch Kinder Morgan line runs perpendicular to the levee embankment on the east embankment.

3. Site Geology and Subsurface Conditions

3.1 Site Geology

Sacramento and the project site are situated within the Great Valley geomorphic province of California. The Great Valley is a gently-sloping to flat alluvial plain east of the Coastal Ranges and west of the Sierra Nevada. It is a northwest trending structural trough that was formed by the westward tilting of the Sierra Nevada block.

The Sacramento Valley in general is underlain by alluvial, lacustrine and marine sedimentary deposits that have accumulated as the structural trough formed and the adjacent mountain ranges were elevated. The thickness of the sediments varies from a thin veneer along the valley margins to thousands of feet at the axis of the trough.

According to the Geologic Map of the Sacramento Quadrangle (Wagner, D.L., et al, 1981) and the Geologic Map of Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills (Helley, E.J. and Harwood, D.S., 1985, USGS, Map MF-1790), the site is immediately underlain by Holocene (less than 11,000 years old) age alluvial deposits. The natural alluvial deposits in the area typically consist of unconsolidated silt, sand and gravel, which were deposited by the complex Sacramento and American River system. The recent alluvial deposits are horizontally bedded channeled and relatively thin. These recent alluvial deposits are underlain by older (Pleistocene age) alluvium of the Riverbank and/or Turlock Lake Formations estimated to be between 11,000 and 1.8 million years old. The deeper formations consist of semi-consolidated silt, sand and gravel deposited as alluvial fans by the streams and rivers that drained the Sacramento Valley and Sierra Nevada. The general vicinity of the site is reclaimed land that was filled-in in the time frame of 1860's and 1900's. The magnitude of the fill material that was placed at that time is unknown.

The surface distribution of sediment is generally a function of lateral distance from the river channel and topographic elevation; i.e, sediments are relatively coarser proximal to the river, and finer closer to the river in the low lying areas.

3.2 Subsurface Conditions

The existing borings and cone penetration tests (CPT) performed for levee evaluations on the crest and in the vicinity of the West Sacramento levee (the west end of the planned bridge), encountered approximately 15 feet of loose sand with silt (SP-SM) in the embankment. The sand with silt was underlain by an approximately 9 foot layer of clay (CL), followed by an approximately 16 feet thick layer of sandy silt (ML). The sandy silt was underlain by approximately 35 feet of sand with silt (SP-SM). The apparent densities of the sand with silt ranged from medium dense to very dense. The sand with silt was underlain by approximately

25 feet of very dense gravel (GP), followed by a layer of clay (CL). The maximum depth explored was approximately 115 feet.

The existing borings and cone penetration tests on the east end (city of Sacramento) of the planned bridge at the crest of existing levee encountered approximately 6 feet of loose sand with silt (SP-SM). The sand with silt was underlain by approximately 10 feet of loose sand (SP), followed by approximately 7 feet of sandy silt (ML). The sandy silt layer was underlain by approximately 50 feet of sand with silt (SP-SM). The densities of the sand with silt layer varied from loose to medium dense. The sand with silt layer was underlain by an approximately 23 feet thick layer of medium dense to very dense gravel (GP), followed by a layer of clay (CL). The maximum depth explored was approximately 110 feet.

The historic boring logs are provided in Appendix III. The locations of the existing borings and cone penetration tests are shown in Appendix I, Figure 1.

3.2.1 Soil Types

The extent and composition of near surface soil materials at the project site and vicinity have been mapped by the USDA National Resource Conservation Service (NRCS) (USDA, 2013). Maps by the NRCS indicate that the upper 5 feet of the project site is underlain by soils assigned to the Lang sandy sandy loam as well as Sycamore silty loam on the west embankment and Orthents on the east embankment with ground slopes 0 to 2 percent.

3.3 Material Properties

The material properties used in the preliminary studies were determined using empirical correlations to SPT N-values and CPT normalized tip stresses from the information provided in the existing explorations. In selecting strength parameters, distinction was made between freely draining materials and non-freely draining materials. Freely draining materials are defined as coarse-grained materials with little or no plastic fines such that, when sheared, do not generate excess pore water pressure. Table 1 in Appendix II provides details on the stratigraphy, field and laboratory test data, and estimates of material parameters used in the preliminary evaluation of potential bridge foundation types.

3.4 Idealized Soil Profile

Soil conditions on the west embankment are anticipated to consist of a sand with silt embankment overlying a clay (CL) and sandy silt (ML) blanket, and a thick sand with silt aquifer overlying a poorly graded gravel layer and stiff clay layer. Soil conditions on the east embankment are anticipated to consist of a sand with silt embankment underlain by a poorly graded sand and a sandy silt (ML) blanket, and a thick sand with silt aquifer overlying a poorly graded gravel layer and stiff clay layer.

Figures 2 and 3 in Appendix I, show the interpreted stratigraphy and relevant material properties along the Railyard Boulevard bridge alignment, and Figures 4 and 5 show the interpreted stratigraphy and relevant material properties along the Camille Lane bridge alignment.

3.5 Groundwater

Groundwater is expected to vary seasonally. Groundwater was encountered during previous drilling explorations at a depth of approximately 15 to 25 feet below the ground surface (Elevation ranging from approximately 0 to 5.5 feet NAVD88).

Groundwater levels can vary over time in response to environmental/seasonal and land use changes. For this reason, groundwater levels at the time of construction or in the future could differ from those indicated in previous boring logs.

4. Recommendations

4.1 Scour Evaluation

Preliminary evaluation of scour potential was limited to a qualitative analysis of the materials that were encountered in the borings on the east and west bank of the river below the channel elevation. In general, the materials observed below the river bottom consist of sand with silt overlying sand with gravel and gravel. The river bottom material is potentially susceptible to scour. GEI recommends at least one exploration be done in the river channel to confirm the river channel material, and better quantify the potential for scour.

4.2 Corrosion Evaluation

The USDA (NRCS) web soil survey indicates pH values in the range of 5.1 to 8.4 at the site.

Caltrans considers a site to be corrosive to foundation elements if one or more of the following conditions exist (Caltrans, "Corrosion Guideline", Version 1.0, September 2003):

- Chloride concentration is greater than or equal to 500ppm,
- Sulfate concentration is greater than or equal to 2000ppm, or
- pH is 5.5 or less.

Based on the available information from USDA (NRCS), some soils within the project vicinity may be susceptible to corrosion in the top 6 inches. This information is only available for the western bridge abutment. Further site specific investigation and laboratory testing of soil is recommended to provide a more detailed evaluation.

4.3 Seismic Design

4.3.1 Ground Motion Information

Deterministic and probabilistic acceleration response spectra (ARS) were generated using Caltrans ARS Online (Caltrans, 2013). The ARS curves are included in Figure 7. The Caltrans ARS Online website describes how this web-based tool calculates spectra based on the criteria provided in Appendix B of Caltrans Seismic Design Criteria (Caltrans, 2010):

> *The deterministic spectrum is determined as the average of median response spectra calculated using the Campbell-Bozorgnia (2008) and Chiou-Youngs (2008) ground motion prediction equations developed under the "Next Generation Attenuation" project coordinated through the PEER-Lifelines program. These equations are applied to all faults considered to be active in*

the last 750,000 years (late-Quaternary age) that are capable of producing a moment magnitude earthquake of 6.0 or greater. The probabilistic spectrum is obtained from the USGS (2008) National Hazard Map for 5% probability of exceedance in 50 years. Caltrans design spectrum is based on the larger of the deterministic and probabilistic spectral values. Both the deterministic and probabilistic spectra account for soil effects through incorporation of the parameter V_{s30}, the average shear wave velocity in the upper 30 meters of the soil profile.

To develop a preliminary V_{s30}, USGS V_{s30} map server online was used. Additional in-situ testing is recommended to develop a site specific V_{s30} value. The shear wave velocities and site location were input into the Caltrans ARS Online website to arrive at the controlling deterministic scenario (CDS) and the ground motions summarized in the table below. The relevant fault map is shown in Figure 6. The preliminary recommended response spectrum is shown in Figure 7. Based on the results of the Caltrans seismic design procedures using ARS online, a maximum considered (975-year return period) peak ground acceleration (PGA) of 0.262g is estimated for the site.

Fault Parameters						Site Parameters			
CDS	FID	Style	Dip (deg)	MM (max)	RRUP (km)	Vs_{30} (m/s)	PGA (g)	NFF	BAF
Great Valley 03 Mysterious Ridge	82	Rev	20	7.0	50.039	240	0.124	1	1
Great Valley 03a Dunnigan Hills	95	Rev	20	6.4	26.45	240	0.144	1	1
San Andreas 2011 CFM	80	SS	90	8	127.82	240	0.066	1	1

4.3.2 Seismic Hazards

4.3.2.1 Liquefaction

Liquefaction describes the loss of shear strength in saturated soils as a result of pore pressure increasing due to ground shaking. Liquefaction typically occurs in saturated near-surface soil

layers consisting of poorly graded loose sands and gravels, and non-plastic silts (Kramer, 1996).

The historic exploratory borings revealed that the project site is underlain by clean to silty sands in a loose to medium dense condition below the groundwater table. The clean to silty sand layer starts at an approximate elevation of 0 to 10 feet (NAVD88) and ranges from 35 to 45 feet thick. This soil layer was found to be prone to liquefaction. Liquefaction analyses were performed on several historic explorations that include this silty sandy layer. In addition to the analyses performed, liquefaction analyses have been performed within this area in several referenced reports including the Problem Identification Report (PIR) of Sacramento River East Levee Downstream of American River prepared by Kleinfelder (2013), the Final Geotechnical Report for the 5th Street North of UPRR as part of the Railyards Boulevard Improvements Project prepared by Blackburn Consulting (2010), and the Geotechnical Evaluation Report (GER) Volume 1 on Existing Conditions for the West Sacramento Study Area prepared by URS, GEI Consultants, and Fugro (2012).

Liquefaction analyses were performed on borings WM0004_015B, WM0004_031B, WM0004_015C, WM0004_014C, and WM0004_030C on the west embankment and WSESAR_002C on the east embankment. Liquefaction analysis was performed according to the methods recommended in the "Liquefaction Resistance of Soils: Summary Report from 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation Liquefaction Resistance of Soils," by Youd et al. (2001). A PGA of 0.262 g and magnitude of 7 were used for the analyses, and estimated based on an earthquake having a return period of 975 years. A design water level was assumed to be at an elevation of 20 feet (NAVD 88) to account for seasonal fluctuations in the river. Existing DWR sensor data has indicated groundwater levels up to an elevation 25 feet during the winter months, but ranging between approximately 15 and 25 feet.

In these reports, and our own analyses, normalized CPT tip resistance and blow counts are lower than the liquefaction threshold criteria and, therefore, the site should be considered prone to liquefaction within the silty to clean sand layer. Liquefaction analyses are shown in Appendix IV.

4.4 Preliminary Foundation Considerations

4.4.1 Shallow Foundations

It is our opinion that shallow foundations are not suitable for support of the planned bridge because of the expected high bridge loads and the shallow alluvium that is susceptible to liquefaction. We recommend the planned bridge be supported on deep foundations extending into more competent soils that underlie the site. Deep foundations will allow bridge loads to be transferred to more suitable soils, and minimize settlement of future bridge.

4.4.2 Driven Piles

Driven piles are considered feasible for the support of the bridge structure. Driven piles would consist of precast concrete or steel piles, extending into the dense gravel layer that underlies the site. Driven piles extending into the dense gravel would generate large tip resistance. According to preliminary analysis, a single 16-inch square driven concrete pile, 40 feet in length, is expected to have an ultimate axial pile capacity of approximately 450 kips if embedded 10 feet into the gravel layer (approximate elevation of -48.0 feet NAVD88) within the channel and 580 kips if embedded at the east or west abutment areas.

The bridge abutments and bents would be supported by a group of piles. In general, the axial capacity of pile groups would not be reduced if the piles are spaced a minimum of 3 pile diameters apart, center to center spacing. Pile capacity was determined according to Caltrans Bridge Design Specifications (2003) and NAVFAC Foundation and Earth Structures (1986). Site-specific explorations within the channel will provide a more accurate analysis of pile capacity. Lateral capacity of the driven piles and pile groups will be evaluated during final design. In this evaluation, liquefaction will need to be further analyzed due to the potential adverse impacts to pile performance.

4.4.3 Drilled Piles

Cast-In-Drilled-Hole (CIDH) piles are considered potentially feasible for the support of the bridge structure. Single CIDH foundations would likely have larger capacities that a single driven pile. However, several challenges exist including drilling in and extending CIDH foundation elements through expected saturated sands. The coarse grained alluvial soils would likely cave during drilling without slurry or temporary casing being utilized for ground support.

Further study of the CIDH foundation option with the use of permanent casing may be warranted if large foundation loads preclude the use of driven pile groups.

4.5 Levee Impacts

According to the USACE *Clarification Guidance on the Policy and Procedural Guidance for Approval of Modifications and Alterations of Corp of Engineers Projects*, bridge construction should consider the impact of bridge construction on the general performance of the levee with consideration of the full range of loading conditions. Considerations during bridge design and construction should include, but not be limited to: backfill material and compaction requirements, bridge abutments effect on scour and erosion along the embankment, underseepage, through seepage, and slope stability. Further evaluation of levee performance will be performed as the bridge design is finalized.

4.6 Additional Field Work and Laboratory Testing

GEI recommends additional field exploration and laboratory testing be performed as the planning and design of the I Street Bridge Replacement Project progresses. At least one exploration is recommended at each bent and abutment location, depending on the size of the pile groups for the abutments and bents. This would include explorations within the Sacramento River channel at planned bent locations. The explorations should include both CPT explorations and rotary wash borings to obtain SPT samples and blow counts in the granular material and high quality undisturbed samples in the fine grained soils.

GEI also recommends that the CPTs include seismic testing to develop a refined site-specific shear wave velocity of design (V_{s30}). The CPT's should be performed in advance of the borings to provide information on the stratigraphy and soil parameters to better plan the boring locations and sampling intervals. The borings will likely be performed with rotary drilling methods to allow for the collection of high quality samples. Laboratory testing should be performed on undisturbed samples retrieved from the borings. Testing should include, at a minimum, index testing, sieve analyses, soil corrosivity, consolidation testing, and triaxial compression testing.

5. Closure

This Preliminary Geotechnical and Foundation Report was prepared for Mark Thomas and Company for use in planning and preliminary design of the proposed I Street Bridge Replacement Project.

GEI prepared the conclusions, recommendations, and professional opinions of this report in accordance with the generally accepted geotechnical principles and practices at this time and location. This report and the drawings contained in this report are intended for preliminary design-input purposes; they are not intended to act as final design input, construction drawings, or specifications.

The scope and services did not include any environmental assessments for the presence or absence of hazardous or toxic materials in the soil, surface water, groundwater, or atmosphere.

Soil and rock deposits can vary in type, strength, and other geotechnical properties between points of observations and explorations. This is a preliminary report which utilizes existing explorations that have been projected to the project location. The recommendations presented within this report are based on these projected explorations, and are subject to confirmation based on further investigation and conditions revealed by construction.

References

Blackburn Consulting, Final Geotechnical Report for the 5th Street North of UPRR as part of the Railyards Boulevard Improvements Project, July 2010.

Bray, J. and Sancio, R. (2006), "Assessment of the Liquefaction Susceptibility of Fine-Grained Soils," Journal of Geotechnical and Geoenvironmental Engineering, ASCE, Vol. 132, No. 9, September 2006

Caltrans. (2013, April 18). *Caltrans ARS Online (V2.2.06)*. Retrieved January 18, 2013, from California Department of Transportation: http://dap3.dot.ca.gov/ARS_Online/index.php

Caltrans. (2009). *Foundation Report Preparation for Bridge Foundations* . California Department of Transportation.

Caltrans. (2010). *Standard Specifications.* Sacramento: California Department of Transportation.

Caltrans. (2003). *Bridge Design Specifications.* California Department of Transportation.

Idriss, I. and Boulanger, R. (2008), "Soil Liquefaction During Earthquakes," EERI Monograph MNO-12

Peterson, P.K. (2009), "Performance Based Earthquake Design using the CPT," Proceedings of the International Conference on Performance-Based Design in Earthquake Geotechnical Engineering (IS-TOKYO 2009, 15-18 June 2009

Seed, R. B., Cetin, K. O., Moss, R. E. S., Kammerer, A., Wu, J., Pestana, J., Riemer, M., Sancio, R. B., Bray, J. D., Kayen, R. E., and Faris, A. (2003). "Recent Advances in Soil Liquefaction Engineering: A Unified and Consistent Framework," Keynote Presentation, 26th Annual ASCE Los Angeles Geotechnical Spring Seminar, Long Beach, CA

State of California Department of Water Resources, Division of Flood Management; Soil and Rock, Logging, Classification, and Presentation Manual; September 2009

State of California Department of Water Resources, Phase 1 Geotechnical Data Report (P1GDR) for the West Sacramento River Study Area, prepared by URS, GEI Consultants, and Fugro, August 2008.

State of California Department of Water Resources, Phase 1 Geotechnical Data Report (P1GDR) for the Sacramento River Study Area, prepared by URS, GEI Consultants, and Fugro, November 2008.

State of California Department of Water Resources, Supplemental Geotechnical Data Report (SGDR) for the Sacramento River Study Area, prepared by URS, GEI Consultants, and Fugro, September 2011.

State of California Department of Water Resources, Geotechnical Evaluation Report (GER) Volume 1, Existing Conditions for the West Sacramento Study Area prepared by URS, GEI Consultants, and Fugro, November 2012.

State of California Highway Transportation Agency, West End Viaduct As-Built Plans, dated December 1966.

Terzaghi, K., Peck, R.B., 1968. Soil Mechanics in Engineering Practice, 2nd Edition, John Wiley & Sons, New York

Tomlinson, M.J., 1981. Pile Design and Construction Practice, Viewpoint, London

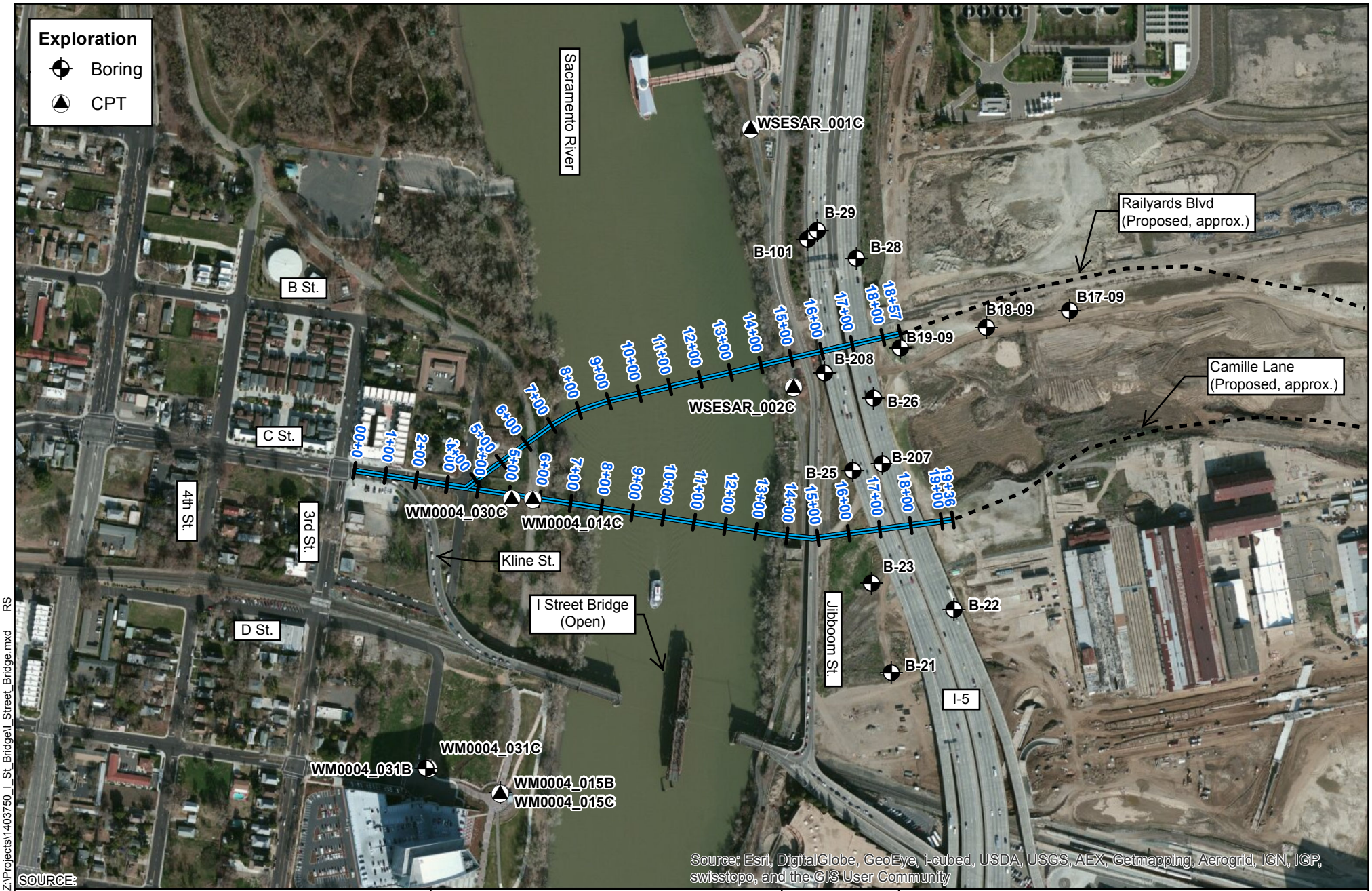
United States Department of Transportation, Federal Highway Administration, 2002. NHI Course No. 132031, Subsurface Investigations – Geotechnical Site Characterization, Reference Manual, May 2002

United States Army Corp of Engineers, Memorandum of Understanding Respecting the Sacramento River Flood Control Project, November 6, 1953

United States Department of the Navy, *Foundation and Earth Structures*. Design Manual 7.2; NAVFAC DM-7.2. Department of the Navy. 1986.

Youd, T. L., Idriss, I. M., Andrus, R. D., Arango, I., Castro, G., Christian, J. T., Dobry, R., Liam Finn, W. D., Harder, L. F., Jr., Hynes, M. E., Ishihara, K., Koester, J. P., Laio, S. S. C., Marcuson, III,W. F., Martin, G. R., Mitchell, J. K., Moriwaki, Y., Power, M. S., Robertson, P. K., Seed, R. B., Stokoe, II, K. H. (2001). ‘‘Liquefaction resistance of soils: Summary report from the 1996 NCEER and 1998 NCEER/NSF workshops on evaluation of liquefaction resistance of soils,’’ J. Geotech. & Geoenv. Engrg., 127(10): 817–833

Appendix I – Figures



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Feet

I Street Bridge Replacement
Sacramento, California

Mark Thomas & Company

GEI Consultants

SITE AND EXPLORATION LOCATION PLAN

APRIL 2014 **DRAFT** FIGURE 1

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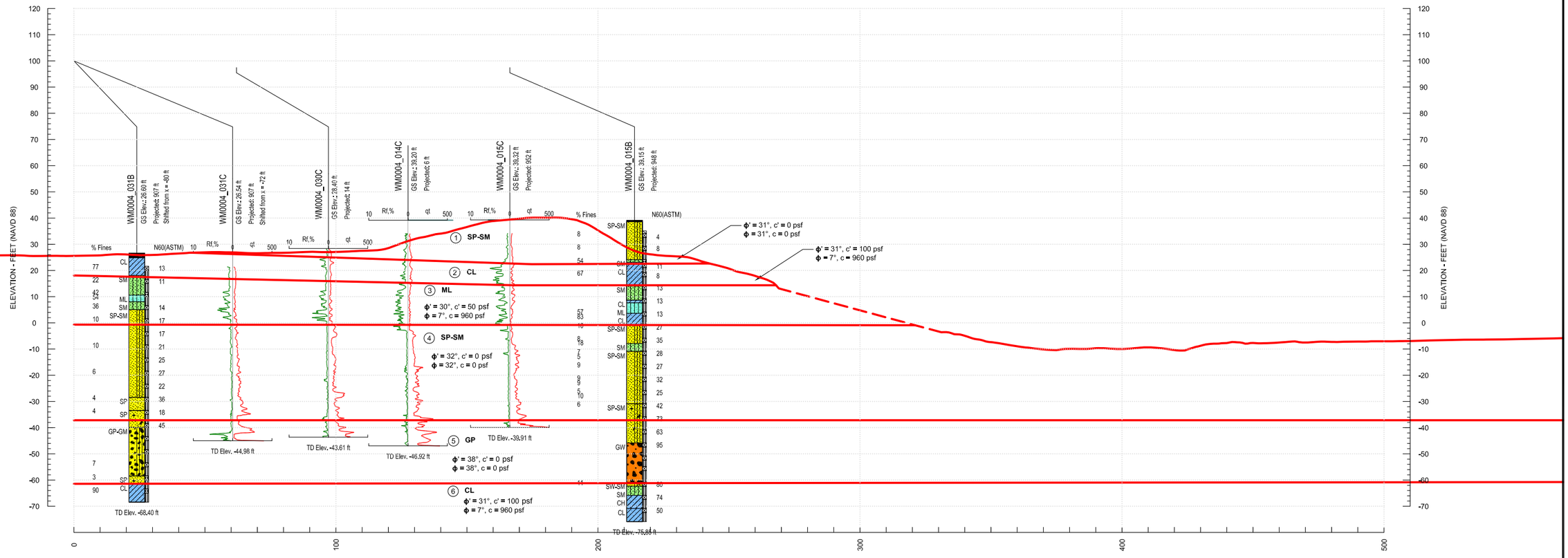

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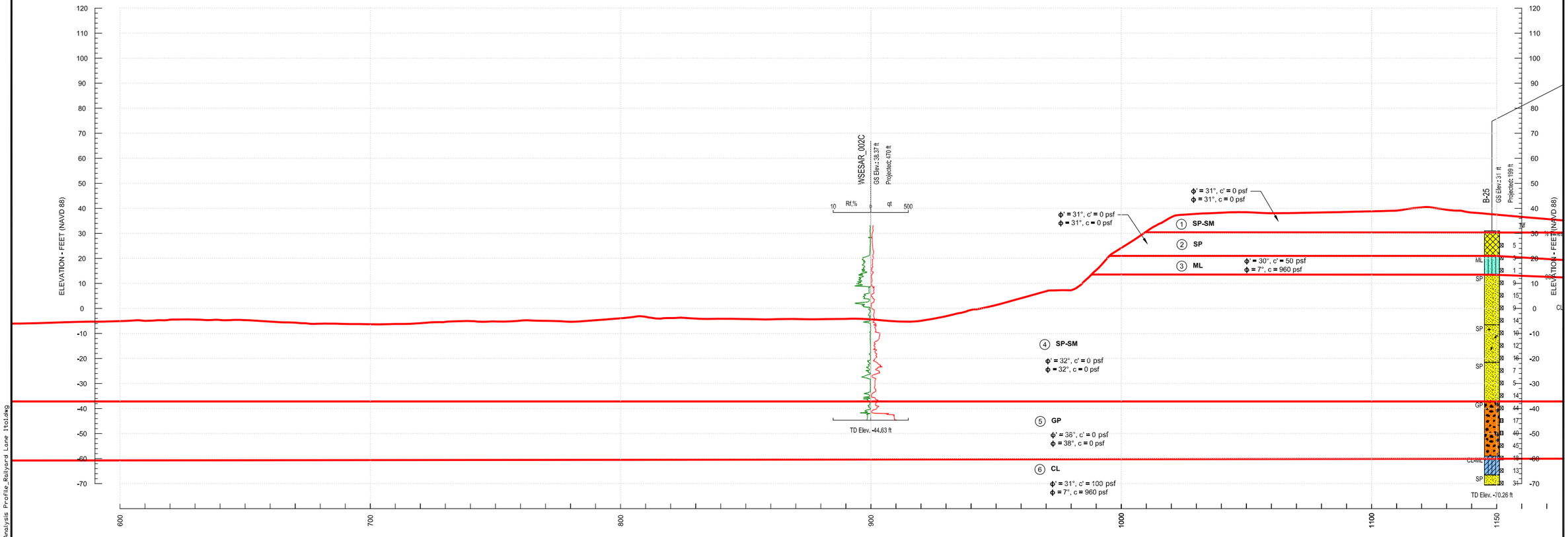
Mark Thomas and Company		May 2014	DRAFT **Figure 02**



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SCALE IN FEET

I Street Bridge Replacement Project
Sacramento, CA

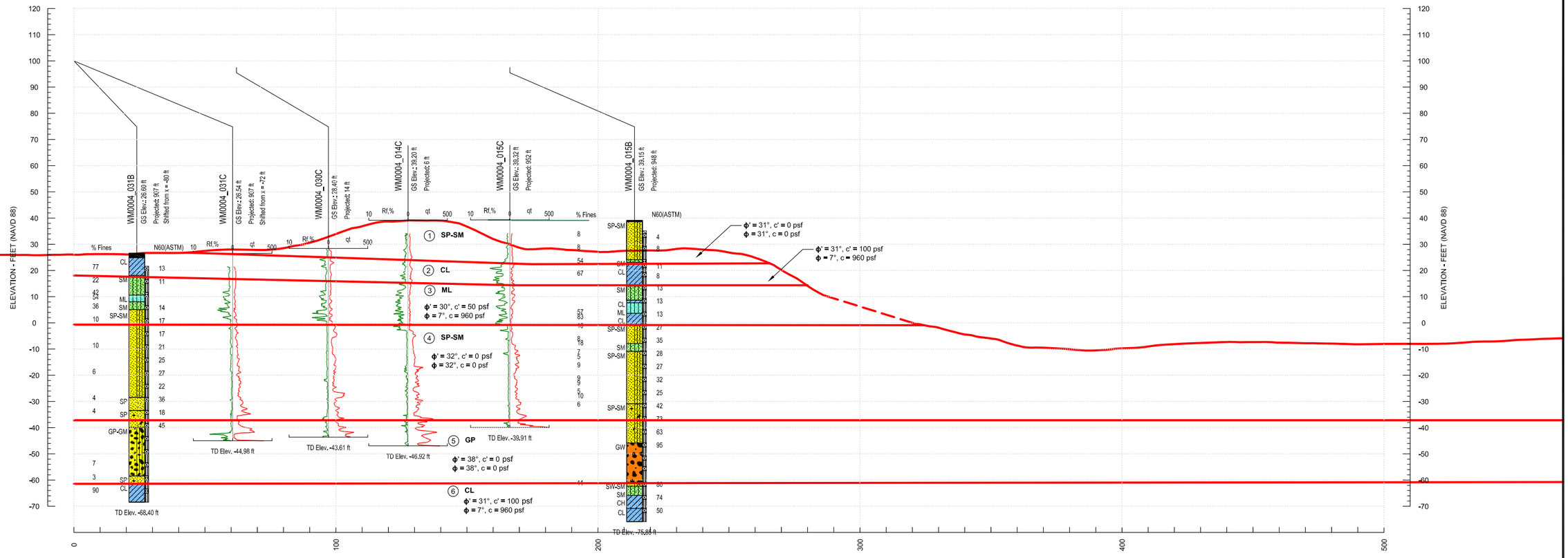
Mark Thomas and Company

GEI Consultants

East Embankment
Railyard Boulevard Alignment

May 2014 **DRAFT** **Figure 03**

DRAWING: J:\Mark Thomas & Company\Project\I Street Bridge\Explorations\CAD\Analysis Profile_Railyard Lane 1to1.dwg



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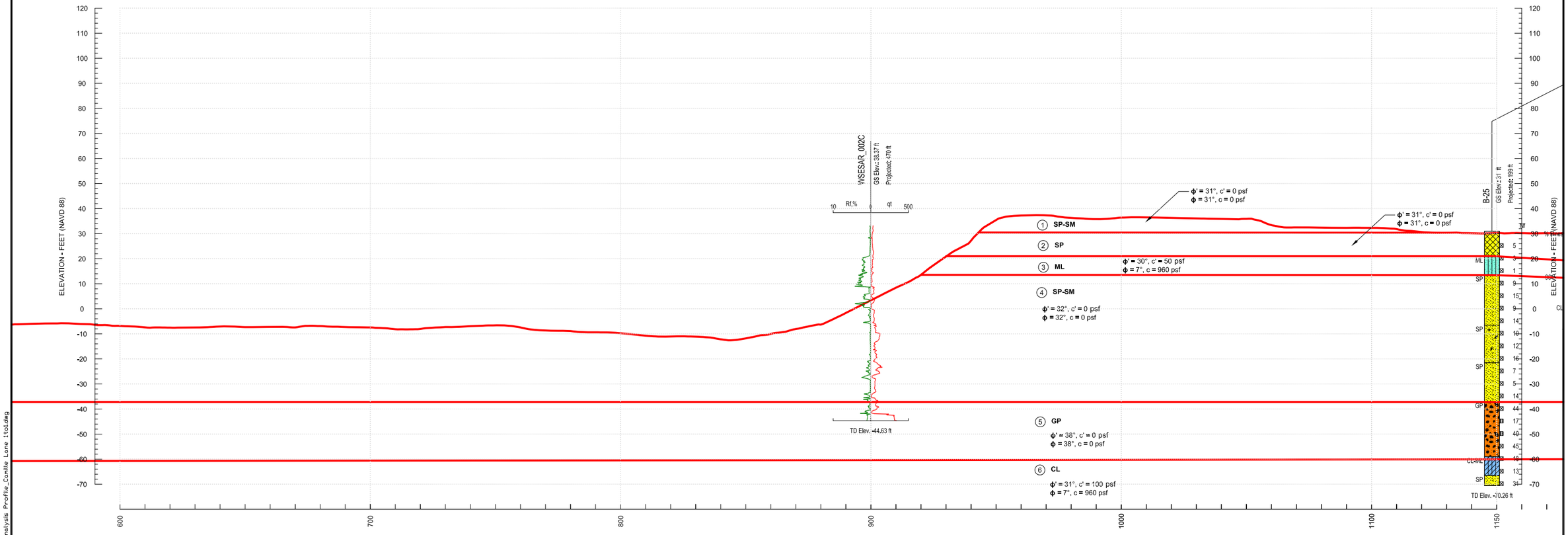
I Street Bridge Replacement Project Sacramento, CA	GEI Consultants	**West Embankment** **Camille Lane Alignment**	
Mark Thomas and Company		May 2014	DRAFT **Figure 04**



DRAWING J:\Mark Thomas & Company\Project\I Street Bridge\Explorations\CAD\Analysis Profile_Camille Lane 1to1.dwg

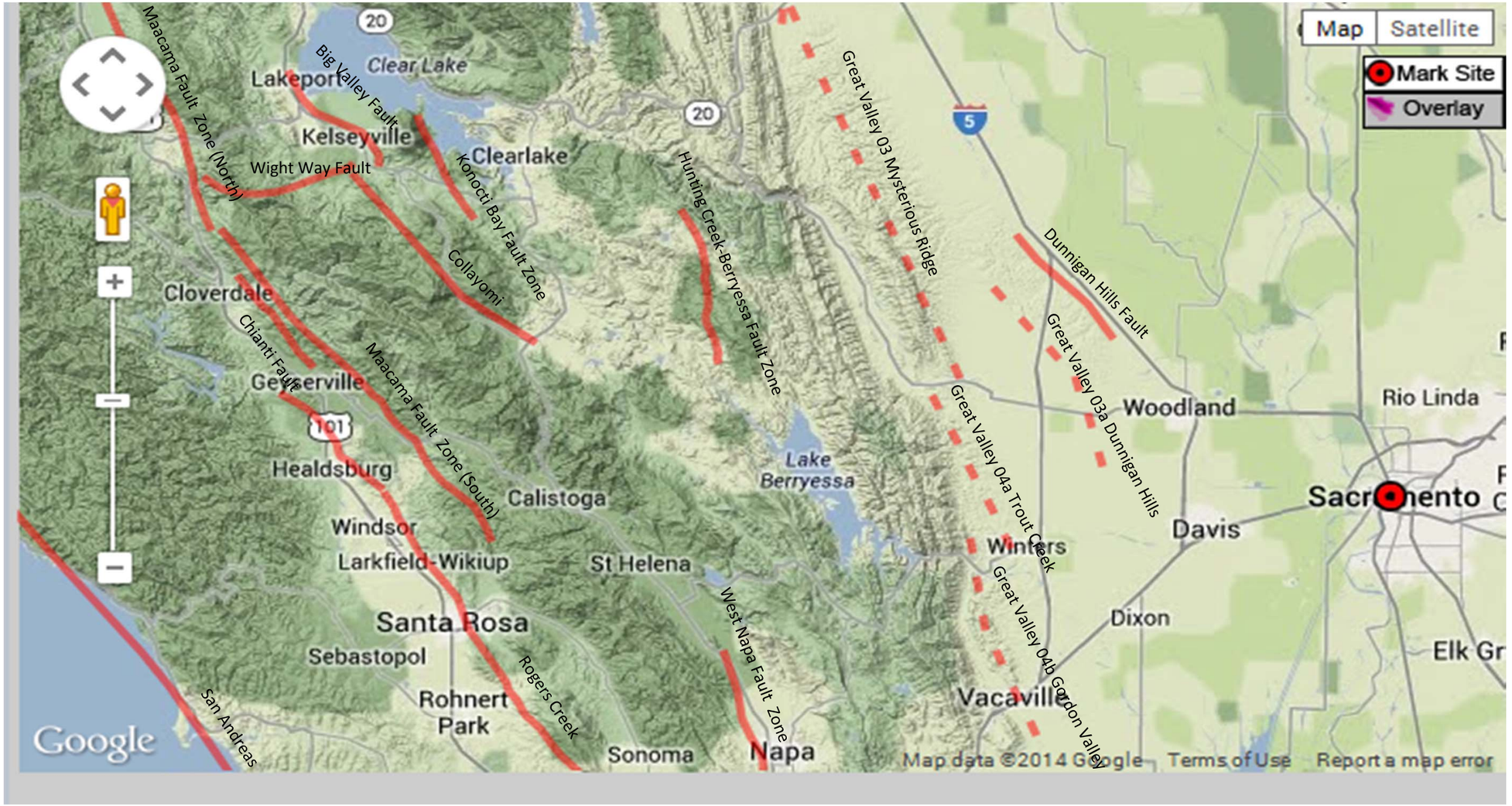
I Street Bridge Replacement Project
Sacramento, CA

Mark Thomas and Company

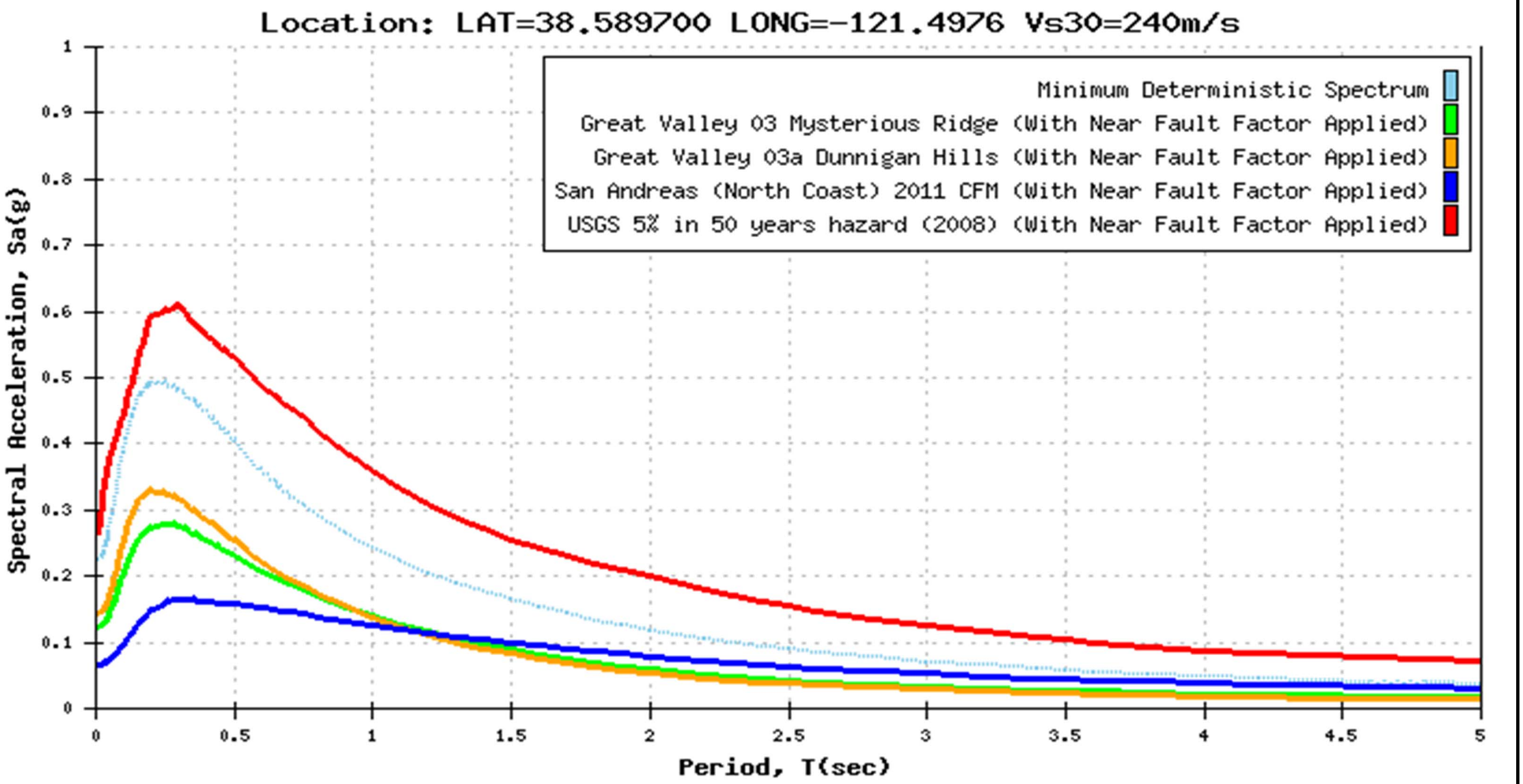
GEI Consultants

East Embankment
Camille Lane Alignment

May 2014 **DRAFT** **Figure 05**



I Street Bridge Replacement Sacramento, CA	Preliminary Geotechnical and Foundation Report	Figure 6. Fault Map March 2014



I Street Bridge Replacement Sacramento, CA	Preliminary Geotechnical and Foundation Report	Figure 7. Recommended Response Spectrum March 2014

Appendix II – Tables

PROJECT: I Street Bridge
SUBJECT: Parameter Selection for Analysis
EXPLORATION(S): WSESAR_002C, B-207, B-21, B-22, B-23, B-25, B17-09, B18-09, B19-09

Table 1 Material Properties for Analysis

Study Area: East Embankment (I Street Bridge)

Prepared By: Ian Maki **Date:** 4/18/2014
Checked By: Madison Weber **Date:** 4/18/2014

GEI Consultants

Material Description (Layer Number)	Zone	Soil Layer Details					Field Test Data						Laboratory Test Data																				Strength and Permeability Related Interpretation								Values Considered In Selection of Strength Parameters				Preliminary Parameters					Comments
							SPT		CPT			Vane Shear	Strength Index		Index Tests							Consolidation Tests			Drained Shear Test				ICU				SPT	CPT				Vane Shear										
		Depth to Top of Layer (feet)	Depth to Bottom of Layer (feet)	Elevation of Top of Layer (NAVD 88, feet)	Elevation of Bottom of Layer (NAVD 88, feet)	Layer Thickness (feet)	N_{60}	$(N_1)_{60}$ [1,2]	q_t - Average Interpreted Value(tsf)	Q_{tn} [6]	Vane Shear [su(psf)]	Pocket Penetrometer (tsf)	Torvane (ksf)	Water Content (%)	Total Unit Weight (pcf)	Dry Unit Weight (pcf)	LL (%)	PI (%)	LI	% Passing #200 Sieve	Maximum Past Pressure, σ'_p (ksf)	Effective Overburden Pressure, σ'_{vo} (ksf)	OCR	Test Type (Triaxial - TX, Direct Simple Shear - DSS, Drained Direct Shear -	C' (psf)	ϕ' (degrees)	C/σ'vmc	C' (psf)	ϕ' (degrees)	C (psf)	ϕ (degrees)	ϕ' from N (deg)[3]	ϕ' from CPT (deg)[4]	Max past pressure from CPT (ksf)[5]	OCR from CPT[5]	Undrained shear strength from CPT, S_u (ksf)[5]	Max past pressure from Vane Shear (ksf)	OCR from Vane Shear	OCR	Maximum past pressure (ksf)	Undrained shear strength, S_u (ksf)	S_u/σ'_{vo}	Drained Cohesion, C' (psf)	Drained Friction Angle, ϕ' (deg)	Undrained Cohesion, C (psf)	Undrained Friction Angle, ϕ (deg)	Total unit weight (pcf)	
SP-SM (1)	Embankment	0.0	6.0	36.0	30.0	6.0			30	38.46																					36.27												0	31	0	31	130	
SP (2)	Foundation	6.0	15.0	30.0	21.0	9.0			25	26.31																					32.91												0	31	0	31	130	
ML (3)	Foundation	15.0	23.0	21.0	13.0	8.0			25	22.8									96													15.75	7.525	3.409									50	30	960	7	120	
SP-SM (4)	Foundation	23.0	73.0	13.0	-37.0	50.0			50-90	32.19																					31.46												0	32	0	32	130	
GP (5)	Foundation	73.0	96.0	-37.0	-60.0	23.0			240	128																					38.37												0	38	0	38	130	
CL (6)	Foundation	96.0	106.0	-60.0	-70.0	10.0																																					100	31	960	7	120	

Levee Crest Elevation	36.0	(NAVD 88, feet)
Landside Toe Elevation	33.0	(NAVD 88, feet)
Levee Height	3.0	(feet)
WSE During Exploration (assumed)	20.0	(NAVD 88, feet)
200-year Analysis WSE	34.6	(NAVD 88, feet)

Notes:

- Cells shaded gray have been intentionally left blank.
- Ranges and outliers shown where appropriate.
- Estimated values of OCR values should be estimated based on the following priority of data as available:
  1. Consolidation test results, 2. Field vane test results and 3. CPT test results.
- SPT data should not be used to estimate OCR and effective strength parameters for cohesive soils.

Sources:

[1] Youd, T.L. et al. 2001, "Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils." Journal of Geotechnical and Geoenvironmental Engineering

[2] Burmister, D. M., 1948, The importance and practical use of relative density in soil mechanics: Proceedings ASTM

[3] Federal Highway Administration. 2002, "Evaluation of soil and rock properties." Geotechnical Engineering Circular No. 5, FHWA-IF-02-034

[4] Mayne, P. 2007. Cone Penetration Testing State-of-Practice. NCHRP. Project 20-05

[5] Lunne, T. et al. 1997. Cone Penetration Testing in Geotechnical Practice

[6] Robertson, P.K., 2009, "Interpretation of cone penetration tests - a unified approach."

PROJECT: I Street Bridge
SUBJECT: Parameter Selection for Analysis
EXPLORATION(S): WSESAR_002C, B-207, B-21, B-22, B-23, B-25, B17-09, B18-09, B19-09

Table 1 Material Properties for Analysis

Study Area: West Embankment (I Street Bridge)

Prepared By: Ian Maki **Date:** 4/18/2014
Checked By: Madison Weber **Date:** 4/18/2014

GEI Consultants

Material Description (Layer Number)	Zone	Soil Layer Details					Field Test Data							Laboratory Test Data																				Strength and Permeability Related Interpretation							Values Considered In Selection of Strength Parameters				Preliminary Parameters					Comments
							SPT		CPT			Vane Shear	Strength Index	Index Tests							Consolidation Tests			Drained Shear Test				ICU				SPT	CPT				Vane Shear													
		Depth to Top of Layer (feet)	Depth to Bottom of Layer (feet)	Elevation of Top of Layer (NAVD 88, feet)	Elevation of Bottom of Layer (NAVD 88, feet)	Layer Thickness (feet)	N_{60}	$(N_1)_{60}$ [1,2]	q_t - Average Interpreted Value(tsf)	Q_{tn} [6]	Vane Shear [su(psf)]	Pocket Penetrometer (tsf)	Torvane (ksf)	Water Content (%)	Total Unit Weight (pcf)	Dry Unit Weight (pcf)	LL (%)	PI (%)	LI	% Passing #200 Sieve	Maximum Past Pressure, σ'_p (ksf)	Effective Overburden Pressure, σ'_{vo} (ksf)	OCR	Test Type (Triaxial - TX, Direct Simple Shear - DSS, Drained Direct Shear - DDS)	C' (psf)	ϕ' (degrees)	C'/σ'vmc	C' (psf)	ϕ' (degrees)	C (psf)	ϕ (degrees)	ϕ' from N (deg)[3]	ϕ' from CPT (deg)[4]	Max past pressure from CPT (ksf)[5]	OCR from CPT[5]	Undrained shear strength from CPT, s_u (ksf)[5]	Max past pressure from Vane Shear (ksf)	OCR from Vane Shear	OCR	Maximum past pressure (ksf)	Undrained shear strength, s_u (ksf)	s_u/σ'_{vo}	Drained Cohesion, C' (psf)	Drained Friction Angle, ϕ' (deg)	Undrained Cohesion, C (psf)	Undrained Friction Angle, ϕ (deg)	Total unit weight (pcf)	
SP-SM (1)	Embankment	0.0	15.0	39.0	24.0	15.0	6	9	30	32.08										8												32	34.14										0	31	0	31	130	
CL (2)	Foundation	15.0	23.0	24.0	16.0	8.0	10	9	30	25.32							44	19	0.105	54-67													19.05	8.354	4.123								100	31	960	7	120	
ML (3)	Foundation	23.0	40.0	16.0	-1.0	17.0	13	11	25	15.41							NP	NP	NP	57													15.25	5.084	3.301								50	30	960	7	120	
SP -SM(4)	Foundation	40.0	76.0	-1.0	-37.0	36.0	28	18	50-90	28.93										5-18												36	30.2										0	32	0	32	130	
GP (5)	Foundation	76.0	100.0	-37.0	-61.0	24.0	60	32	240	124																						42	38.02										0	38	0	38	130	
CL (6)	Foundation	100.0	115.0	-61.0	-76.0	15.0	65	34									35	13	0.769																									100	31	960	7	120	

Levee Crest Elevation	**39.0**	**(NAVD 88, feet)**
Landside Toe Elevation	**29.0**	**(NAVD 88, feet)**
Levee Height	**10.0**	**(feet)**
WSE During Exploration (assumed)	**20.0**	**(NAVD 88, feet)**
200-year Analysis WSE	**34.6**	**(NAVD 88, feet)**

Notes:

- Cells shaded gray have been intentionally left blank.
- Ranges and outliers shown where appropriate.
- Estimated values of OCR values should be estimated based on the following priority of data as available:
  1. Consolidation test results, 2. Field vane test results and 3. CPT test results.
- SPT data should not be used to estimate OCR and effective strength parameters for cohesive soils.

Sources:

[1] Youd, T.L. et al. 2001, "Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils." Journal of Geotechnical and Geoenvironmental Engineering

[2] Burmister, D. M., 1948, The importance and practical use of relative density in soil mechanics: Proceedings ASTM

[3] Federal Highway Administration. 2002, "Evaluation of soil and rock properties." Geotechnical Engineering Circular No. 5, FHWA-IF-02-034

[4] Mayne, P. 2007. Cone Penetration Testing State-of-Practice. NCHRP. Project 20-05 and Figure 4-17 EPRI 1990 Mair and Wood (1987)

[5] Lunne, T. et al. 1997. Cone Penetration Testing in Geotechnical Practice

[6] Robertson, P.K., 2009, "Interpretation of cone penetration tests - a unified approach."

Appendix III – Historic Exploration Logs

Phase 1 Geotechnical Data Report (P1GDR) for the West Sacramento River Study Area, prepared by URS, GEI Consultants, and Fugro, August 2008.

WM0004_014C
WM0004_015B
WM0004_015C
WM0004_030C
WM0004_031B
WM0004_031C

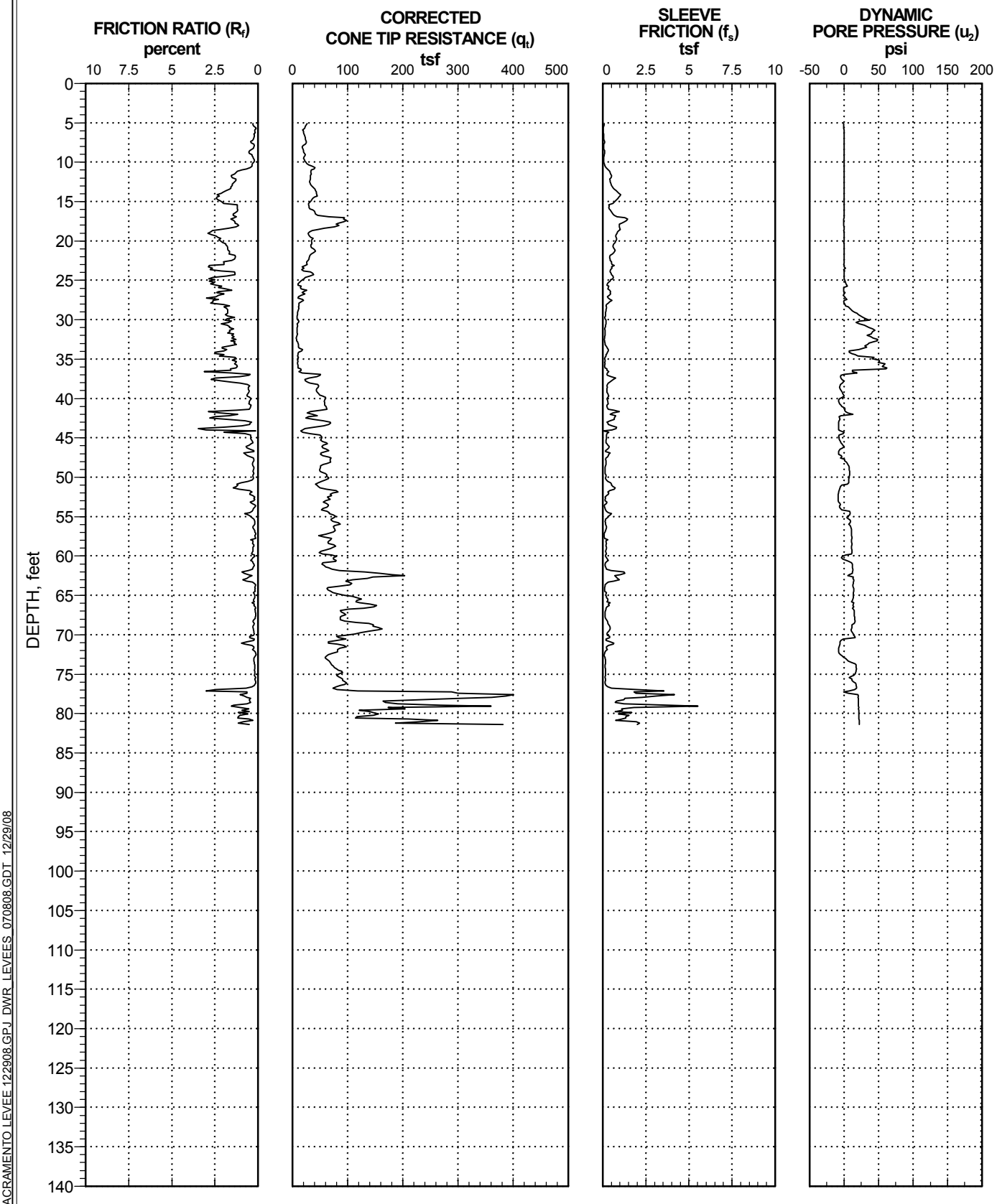
Phase 1 Geotechnical Data Report (P1GDR) for the Sacramento River Study Area, prepared by URS, GEI Consultants, and Fugro, November 2008.

WSESAR_001C
WSESAR_002C

West End Viaduct As-Built Plans, prepared by State of California, Highway Transportation Agency, dated December 1966.

B-21
B-22
B-23
B-25
B-26
B-28
B-29
B-101
B-207
B-208

Blackburn Consulting, 7. Final Geotechnical Report for the 5th Street North of UPRR as part of the Railyards Boulevard Improvements Project, July 2010.
B17-09
B18-09
B19-09

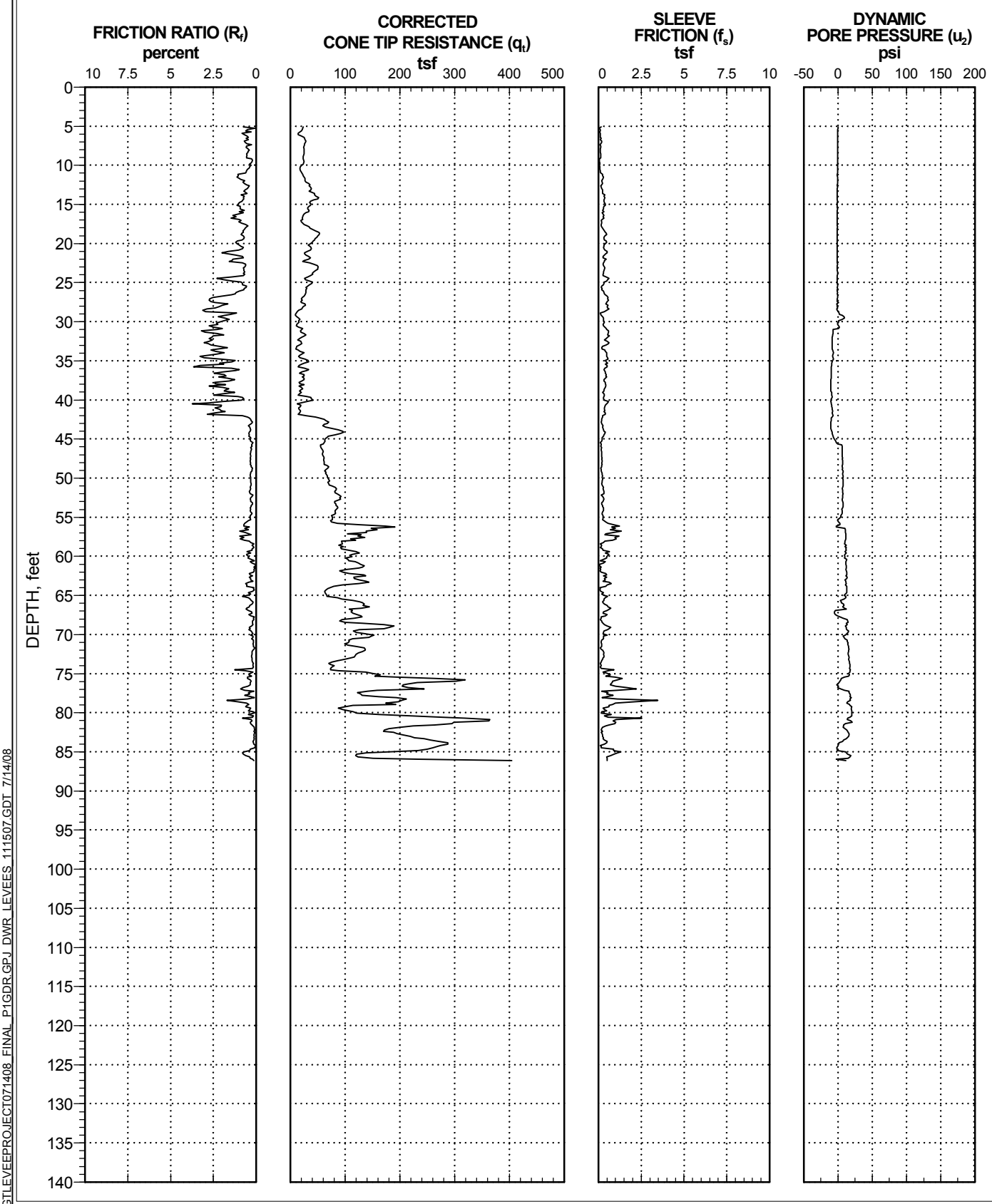


CPT IN LOG FORMAT SACRAMENTO LEVEE 122908.GPJ DWR_LEVEES_070808.GDT 12/29/08

Exploration Location: Levee Crest
Performed by: Gregg Drilling & Testing, Inc. 3/13/2008
Coordinates: North 1,977,589.3 East 6,703,022.8
Levee Station or Milepost: 1018+88.09
GPS: Latitude 38.59142 Longitude 121.50543
Channel / River Name / Feature: Sacramento River
County: Sacramento

CPT Sounding
WSESAR_001C
Sheet 1 of 1

Engineering Support Services
Urban Levee Geotechnical Evaluations
Program



CPT IN LOG FORMAT GTLEVEEPROJECT071408 FINAL P1GDR.GPJ DWR LEVEES 111507.GDT 7/14/08

Exploration Location: Levee crest, East End of C St.
Performed by: Gregg Drilling & Testing, Inc. 1/3/2007
Coordinates: North 1,976,404.7 East 6,702,324.1
Levee Station or Milepost: 1281+38/LM 2.93-MA 4-1
GPS: Latitude 38°35'17.44214"N Longitude 121°30'28.44797"W
Channel / River Name / Feature: Sacramento River
County: Yolo

CPT Sounding
WM0004_014C
Sheet 1 of 1

Engineering Support Services
Urban Levee Geotechnical Evaluations
Program

DATE STARTED **12/19/06** DATE COMPLETED **12/21/06**	GROUND ELEVATION **39.15 ft** ELEVATION BASIS **NAVD88**	TOTAL DEPTH OF BORING **115.0 ft**
DRILLING CONTRACTOR **Gregg Drilling & Testing, Inc.**	DRILLER'S NAME **Angel Salazar** HELPER'S NAME **Eric, Rob**	TOTAL DEPTH OF FILL **20 ft**
DRILLING METHOD **Mud Rotary**	DRILL RIG MAKE AND MODEL **Marl M-10**	CONSULTANT COMPANY **URS Corporation**
DRILL BIT SIZE AND TYPE (HOLE DIAMETER) **6-inch OD; 2-inch ID; Punchcore**	DRILLING ROD TYPE AND DIAMETER **TJ 94 mm, Sampling Rod = NWJ (2.75")**	FIELD LOGGER **T. Pender**
☒ VERTICAL ☐ INCLINED	CASING TYPE, DIAMETER, INSTALLATION DEPTH **Steel, 6"**	FIELD LOG REVIEWER **T. Kolbe**
SAMPLER TYPE(S) **Punchcore(2.52"), SPT(1.38"), Modcal(2"), Shelby(2.38")**	HAMMER TYPE, MAKE/MODEL, WEIGHT/DROP **CME Auto. 140lb/30-inch**	HAMMER EFFICIENCY **83.9%**
BOREHOLE BACKFILL OR COMPLETION **Neat cement grout**	GROUNDWATER READING: DURING DRILLING **NA - Mud Rotary** AFTER DRILLING (DATE-TIME) **NA**	

Elevation, feet	Depth, feet	Material Graphics	FIELD CLASSIFICATION OF MATERIALS (Description)	Sample Location	Sample Number	Recovery, %	Blows per 6 in.	Blows per Foot	N_{60}(ASTM)	PP or TV, tsf	LABORATORY DATA: Water Content, %	LABORATORY DATA: Liquid Limit	LABORATORY DATA: Plasticity Index	LABORATORY DATA: Fines, % < #200	REMARKS
	0		Gravel road base, up to 1-inch gravel.												
	1		Poorly Graded SAND with Silt (SP-SM); loose; dark yellowish brown (10YR 4/6); moist; 78% fine to medium sand; 14% gravel, max. 3./4 in.; 8% fines; no reaction with HCl; weak cementation.												
	2														
	3														
35	4				1						27				S001A_004_005B
	5		At 5 feet same as above except very loose.		2	50	1 2 1	3	4					8	S002A_005_007S End drilling 12/19/06 Resume drilling 12/20/06
	6														
	7				3	10									S003A_007_010P
	8														
30	9														
	10		At 10 feet same as above except loose; 91% sand; 8% fines; trace fine gravel.		4	33	2 3 3	6	8		16			8	S004A_010_012S
	11														
	12				5	14									S005A_012_015P
	13														
25	14														
	15		SILTY SAND (SM); medium dense; dark yellowish brown (10YR 4/6); moist; 80% fine sand; 20% no plasticity fines; no reaction with HCl; weak cementation.		6B 6A	100	7 8 8	16			20 17			54	S006B_015_017M S006A_015_017M
	16		SANDY LEAN CLAY (CL); medium stiff; dark yellowish brown (10YR 4/6); moist; 54% low plasticity, low dry strength, no dilatancy, low toughness fines; 46% fine sand; no reaction with HCl.		7B 7A	33	3 4 4	8	11		22	44	19		S007B_017_018S S007A_017_018S
	17														
	18		At 18 feet same as above except dark yellowish brown (10YR 4/6); 67% low plasticity fines; 33% fine sand.		8	0									S008A_018_020P No recovery
20	19														
	20														

Borehole Location: Levee crest, E Street and Sacramento River
Coordinates: North 1,975,466.94 East 6,702,221.81
Levee Station or Milepost: 1290+98/LM 3.11-MA 4-1
GPS: Latitude 38°35'08.17780"N Longitude 121°30'29.80090"W
Channel / River Name / Feature: Sacramento River
County: Yolo

LOG OF BORING
WM0004_015B
Sheet 1 of 5

Engineering Support Services
Urban Levee Geotechnical Evaluations Program

Elevation, feet	Depth, feet	Material Graphics	FIELD CLASSIFICATION OF MATERIALS (Description)	Sample Location	Sample Number	Recovery, %	Blows per 6 in.	Blows per Foot	N_{60}(ASTM)	PP or TV, tsf	LABORATORY DATA: Water Content, %	LABORATORY DATA: Liquid Limit	LABORATORY DATA: Plasticity Index	LABORATORY DATA: Fines, % < #200	REMARKS
	20				9		3 3 3	6	8		27			67	S009A_020_022S
	21														
	22														S010A_022_025P
	23		At 23 feet same as above except 10" layer of Lean Clay (CL); soft, dark yellowish brown (10YR 3/6), moist; 90% lean clay; 10% fine grained sand; medium plasticity, medium dry strength, no dilatancy, low toughness, no reaction with HCl.		10	71									
15	24														
	25														
			SILTY SAND (SM); medium dense; dark yellowish brown (10YR 4/6); moist; 80% sand; 20% no plasticity fines; no reaction with HCl.		11	44	4 4 5	9	13			NP	NP		S011A_025_027S
	26														
	27														S012A_027_030P
	28				12	29									
10	29														
	30														S013B_030_032S S013A_030_032S
	31		SANDY LEAN CLAY (CL); medium stiff; dark yellowish brown (10YR 3/6); moist; 70% low plasticity, low dry strength, slow dilatancy, low toughness fines; 30% fine sand; no reaction with HCl.		13B 13A	67	3 4 5	9	13		33	30	14		
	32		SANDY SILT (ML); medium stiff; dark yellowish brown (10YR 4/6); moist; 57% no plasticity fines; 43% fine sand; no reaction with HCl; weak cementation.												S014A_032_035P
	33		At 32.5 feet same as above except very dark greenish gray (5GY 3/1).		14	71									
5	34														
	35														S015B_035_037S
	36		LEAN CLAY with Sand (CL); medium stiff; very dark greenish gray (5GY 3/1); moist; 83% no plasticity, medium dry strength, slow dilatancy, medium toughness fines; 17% fine sand; no reaction with HCl.		15B 15A	100	3 4 5	9	13		47	NP 36	NP 6	57 83	S015A_035_037S
	37		At 36.4-36.5 and 37.5-38 feet several partings up to 1/16 inch thick of organic debris, grasses, slight organic odor.												S016A_037_040P Core box sample 37 to 37.5 feet
	38				16	71									
0	39														
	40		Poorly Graded SAND with Silt (SP-SM); medium dense; dark greenish gray (5GY 4/1); moist; 90% fine to medium sand; 10% fines; no reaction with HCl; weak cementation.		17	67	7 10 9	19	27		29			10	S017A_040_042S
	41														
	42														S018A_042_045P
	43				18	57									
-5	44														
	45														

Borehole Location: Levee crest, E Street and Sacramento River
Coordinates: North 1,975,466.94 East 6,702,221.81
Levee Station or Milepost: 1290+98/LM 3.11-MA 4-1
GPS: Latitude 38°35'08.17780"N Longitude 121°30'29.80090"W
Channel / River Name / Feature: Sacramento River
County: Yolo

LOG OF BORING
WM0004_015B

Engineering Support Services
Urban Levee Geotechnical Evaluations Program

Elevation, feet	Depth, feet	Material Graphics	FIELD CLASSIFICATION OF MATERIALS (Description)	Sample Location	Sample Number	Recovery, %	Blows per 6 in.	Blows per Foot	N_{60}(ASTM)	PP or TV, tsf	LABORATORY DATA: Water Content, %	LABORATORY DATA: Liquid Limit	LABORATORY DATA: Plasticity Index	LABORATORY DATA: Fines, % < #200	REMARKS
	45		At 45 feet same as above except dense.		19	61	6 12 13	25	35		24			8	S019A_045_047S
	46														
	47		SILTY SAND (SM); medium dense; dark greenish gray (5GY 4/1); moist; 75% fine to medium sand; 18% fines; no reaction with HCl; weak cementation; trace coarse sand and gravel.		20	100								18	S020A_047_050P Hydro Test Core box sample 47 to 47.5 feet
-10	48														
	49														
	50		Poorly Graded SAND with Silt (SP-SM); medium dense; dark greenish gray (5GY 4/1); moist; fine to medium sand; no reaction with HCl; weak cementation.		21	67	8 9 11	20	28		22			7 5	S021A_050_052S Hydro Test
	51														
	52				22	43									S022A_052_055P
	53														
-15	54														
	55				23	44	7 10 9	19	27		21			9	S023A_055_057S
	56														
	57				24	100									S024A_057_060P
	58														
-20	59														
	60		At 60 feet same as above except dense.		25	67	9 9 14	23	32		23			9 9	S025A_060_062S Hydro Test
	61														
	62				26	86									S026A_062_065P
	63														
-25	64														
	65		At 65 feet same as above except medium dense.		27	67	7 9 9	18	25		24			5 10	S027A_065_067S Hydro Test
	66														
	67				28	71									S028A_067_070P
	68														
-30	69														
	70														

Borehole Location: Levee crest, E Street and Sacramento River
Coordinates: North 1,975,466.94 East 6,702,221.81
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GPS: Latitude 38°35'08.17780"N Longitude 121°30'29.80090"W
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LOG OF BORING
WM0004_015B

Engineering Support Services
Urban Levee Geotechnical Evaluations Program

Elevation, feet	Depth, feet	Material Graphics	FIELD CLASSIFICATION OF MATERIALS (Description)	Sample Location	Sample Number	Recovery, %	Blows per 6 in.	Blows per Foot	N_{60}(ASTM)	PP or TV, tsf	LABORATORY DATA: Water Content, %	LABORATORY DATA: Liquid Limit	LABORATORY DATA: Plasticity Index	LABORATORY DATA: Fines, % < #200	REMARKS
	70		Poorly Graded SAND with Silt and Gravel (SP-SM); dense; dark greenish gray (5GY 4/1); moist; 71% fine to coarse sand; 23% fine, angular to subrounded gravel, max. 0.5 in.; 6% fines; no reaction with HCl; weak cementation.		29	67	9 12 18	30	42					6	S029A_070_072S
	71														
	72		At 71.5 feet same as above except fine to coarse, angular to subangular gravel up to 1.5-inch.		30	86									S026A_062_065P
-35	73														
	74														
	75		At 75 feet same as above except very dense; gravel up to 2-inch.		31	67	5 21 31	52	73		12				S031A_075_077S
	76														
	77				32	0									S032A_077_080P No recovery
-40	78														
	79														
	80				33	0	26 24 21	45	63		4				S033A_080_082S No recovery
	81														
	82				34	0									S034A_082_085P No recovery
-45	83														
	84														
	85		Well-Graded GRAVEL (GW); very dense; dark greenish gray (5GY 4/1); moist; 90% fine to coarse, angular to subrounded gravel, max. 1.5 in.; no reaction with HCl; weak cementation.		35	22	38 34 34	68	95						S035A_085_087S End drilling 12/20/06 Resume drilling 12/21/06
	86														
	87				36	0									S036A_087_090P No recovery
-50	88														
	89														
	90				37	0	>50								S037A_090_092S No recovery
	91														
	92														Driller thinks core barrel will be damaged, drilled from 91.5 to 94 feet with no core barrel
	93														
-55	94				38	17	35 >50				4				S038A_094_096S 50/4"
	95														

Borehole Location: Levee crest, E Street and Sacramento River
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County: Yolo

LOG OF BORING
WM0004_015B

Engineering Support Services
Urban Levee Geotechnical Evaluations Program

Elevation, feet	Depth, feet	Material Graphics	FIELD CLASSIFICATION OF MATERIALS (Description)	Sample Location	Sample Number	Recovery, %	Blows per 6 in.	Blows per Foot	N_{60}(ASTM)	PP or TV, tsf	LABORATORY DATA: Water Content, %	LABORATORY DATA: Liquid Limit	LABORATORY DATA: Plasticity Index	LABORATORY DATA: Fines, % < #200	REMARKS
	95				38	17					4				
	96														No core barrel from 95.5 to 100 feet
	97														
	98														
-60	99														
	100														
	101		Well-Graded SAND with Silt (SW-SM); very dense; dark greenish gray (5GY 4/1); moist; 78% fine to coarse sand; 11% fine gravel; 11% fines; no reaction with HCl; moderate cementation.		39	33	20 27 30	57	80					11	S039A_100_102S
	102		SILTY SAND (SM); very dense; dark greenish gray (5GY 4/1); moist; 80% fine to coarse sand; 20% fines; no reaction with HCl; weak cementation.		40	14									S040A_102_105P
	103														
-65	104														
	105														
	106		FAT CLAY with Sand (CH); hard; olive (5Y 5/4); moist; fine sand; 80% medium plasticity, high dry strength, no dilatancy, high toughness fines; trace fine gravel; no reaction with HCl.		41		14 21 32	53	74	>5P		51	31		S041A_105_107S
	107				42	0									S042A_107_110P No recovery
	108														
-70	109														
	110														
	111		LEAN CLAY with Sand (CL); hard; olive (5Y 5/4); moist; medium plasticity, medium dry strength, slow dilatancy, medium toughness fines; fine sand; no reaction with HCl.		43	44	12 16 20	36	50	4.0P		45	24		S043A_110_112S
	112		At 111.5 feet same as above except 80% lean clay; 20% fine grained sand.		44	86									S044A_112_115P Core box sample 112 to 112.5 feet
	113														
-75	114														
	115														
	116		Bottom of boring at 115.0 feet below ground surface (bgs)												
	117														
	118														
-80	119														
	120														

Borehole Location: Levee crest, E Street and Sacramento River
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Levee Station or Milepost: 1290+98/LM 3.11-MA 4-1
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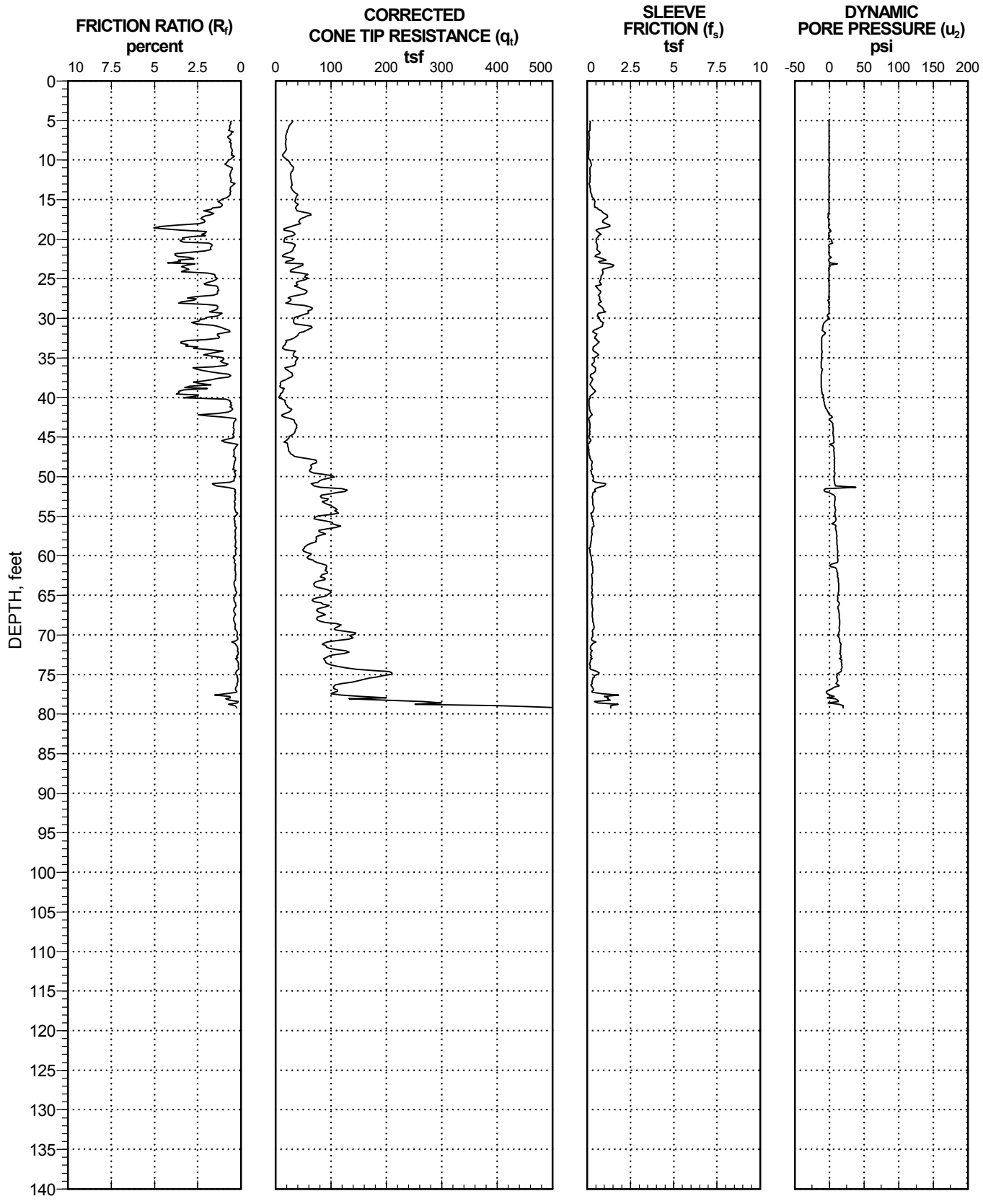
Channel / River Name / Feature: Sacramento River
County: Yolo

LOG OF BORING
WM0004_015B
Sheet 5 of 5

Engineering Support Services
Urban Levee Geotechnical Evaluations Program



CPT IN LOG FORMAT GTLEVEEPROJECT071408 FINAL P1GDR.GPJ DWR LEVEES 111507.GDT 7/14/08

Exploration Location: Levee crest, East End of E St.

Performed by: Gregg Drilling & Testing, Inc. 12/19/2006

Coordinates: North 1,975,463.4 East 6,702,220.6

Levee Station or Milepost: 1291+02/LM 3.11-MA 4-1

GPS: Latitude 38°35'08.14303"N Longitude 121°30'29.81616"W

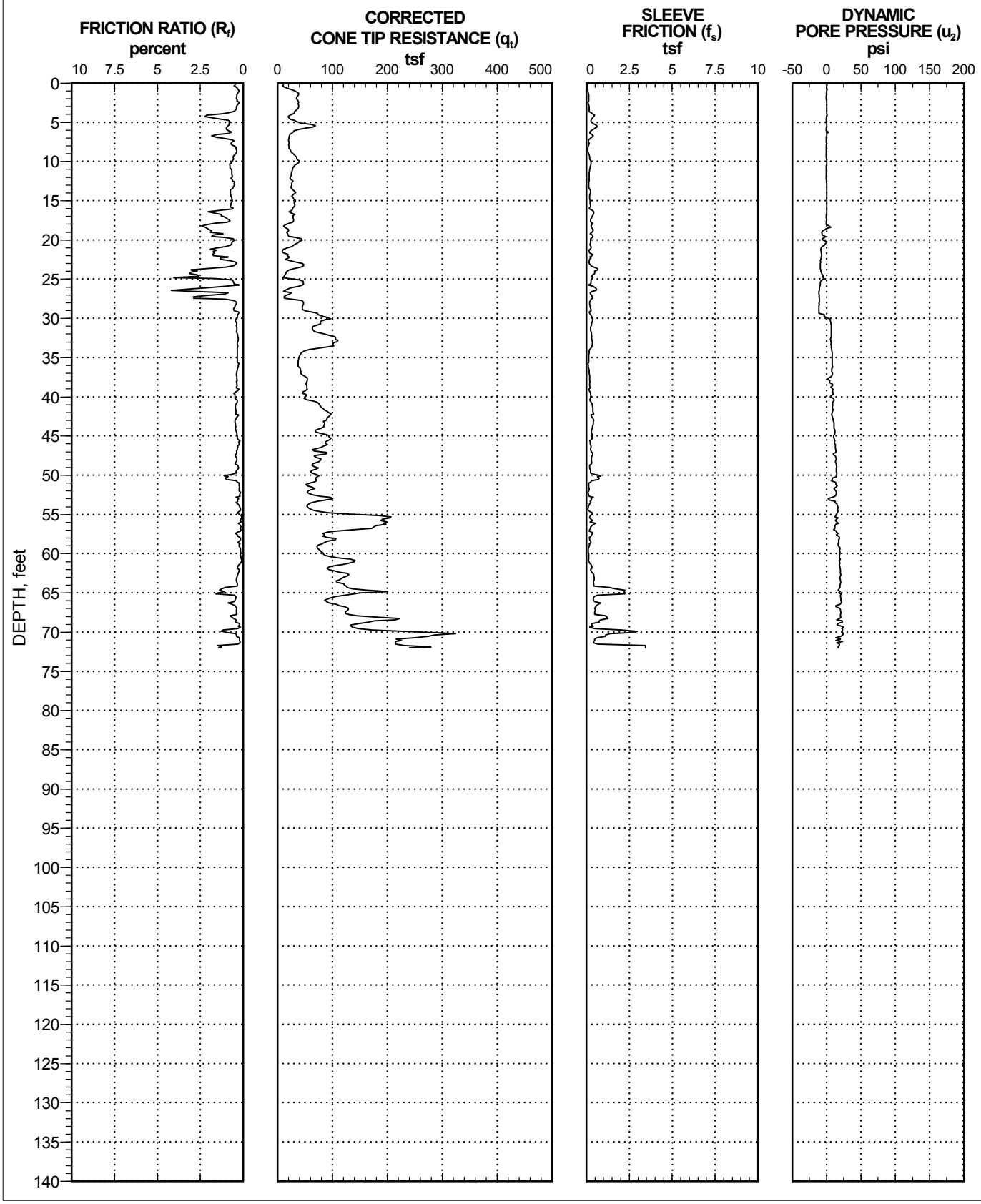
Channel / River Name / Feature: Sacramento River

County: Yolo

CPT Sounding

WM0004_015C

Engineering Support Services
Urban Levee Geotechnical Evaluations
Program



CPT IN LOG FORMAT GTLEVEEPROJECT071408 FINAL P1GDR.GPJ DWR LEVEES 111507.GDT 7/14/08

Exploration Location: Landside levee Toe, East of C St.
Performed by: Gregg Drilling & Testing, Inc. 2/13/2007
Coordinates: North 1,976,406.4 East 6,702,258.2
Levee Station or Milepost: 1281+36/LM 2.93-MA 4-1
GPS: Latitude 38°35'17.46247"N Longitude 121°30'29.27539"W
Channel / River Name / Feature: Sacramento River
County: Yolo

CPT Sounding
WM0004_030C
Sheet 1 of 1

Engineering Support Services
Urban Levee Geotechnical Evaluations
Program

DATE STARTED **2/2/04** DATE COMPLETED **2/5/07**	GROUND ELEVATION **26.60 ft** ELEVATION BASIS **NAVD88**	TOTAL DEPTH OF BORING **95.0 ft**
DRILLING CONTRACTOR **Gregg Drilling & Testing, Inc.**	DRILLER'S NAME **Eric Santellan** HELPER'S NAME **Rick Ryan**	TOTAL DEPTH OF FILL **0 ft**
DRILLING METHOD **Mud Rotary**	DRILL RIG MAKE AND MODEL **Marl M-10**	CONSULTANT COMPANY **URS Corporation**
DRILL BIT SIZE AND TYPE (HOLE DIAMETER) **6-inch OD; 2-inch ID; Punchcore**	DRILLING ROD TYPE AND DIAMETER **TJ 94 mm, Sampling Rod = NWJ (2.75")**	FIELD LOGGER **N. Bernal**
☒ VERTICAL ☐ INCLINED	CASING TYPE, DIAMETER, INSTALLATION DEPTH **Steel, 6"**	FIELD LOG REVIEWER **T. Kolbe**
SAMPLER TYPE(S) **Punchcore(2.52"), SPT(1.38"), Modcal(2"), Shelby(2.38")**	HAMMER TYPE, MAKE/MODEL, WEIGHT/DROP **CME Auto. 140lb/30-inch**	HAMMER EFFICIENCY **83.9%**
BOREHOLE BACKFILL OR COMPLETION **Neat cement grout**	GROUNDWATER READING: DURING DRILLING **NA - Mud Rotary** AFTER DRILLING (DATE-TIME) **NA**	

Elevation, feet	Depth, feet	Material Graphics	FIELD CLASSIFICATION OF MATERIALS (Description)	Sample Location	Sample Number	Recovery, %	Blows per 6 in.	Blows per Foot	N_{60}(ASTM)	PP or TV, tsf	LABORATORY DATA: Water Content, %	LABORATORY DATA: Liquid Limit	LABORATORY DATA: Plasticity Index	LABORATORY DATA: Fines, % < #200	REMARKS
	0		3-inch asphalt concrete over 18-inch road base.												
25	1														
	2		LEAN CLAY with Sand (CL); stiff; very dark gray (5YR 3/1); moist; 77% medium plasticity, medium dry strength, slow dilatancy, medium toughness fines; 23% fine sand; no reaction with HCl.												
	3														
	4														
	5				1	83	3 4 5	9	13		29	34	13	77	S001A_005_007S
20	6														
	7														S002A_007_010P
	8				2	86									
	9		SILTY SAND (SM); medium dense; very dark gray (5YR 3/1); moist; 76% fine sand; 22% fines; trace gravel; weak cementation.												
	10				3	61	3 3 5	8	11		18			22	S003A_010_012S Hydro Test
15	11														
	12														S004A_012_015P
	13				4	100									
	14														
	15		At 15 feet same as above except decrease in sand content to 58%; trace organic matter.		5B	83	2 3 3	6						42	S005B_015_017M Hydro Test
	16		SANDY SILT (ML); medium stiff; very dark gray (5YR 3/1); moist; 54% no plasticity fines; 46% fine sand.		5A						31			54	S005A_015_017M
10	17														S006A_017_020P
	18				6	57									
	19		SILTY SAND (SM); medium dense; very dark gray (5YR 3/1); moist; 64% fine sand; 36% fines.												
	20														

Borehole Location: 160' away from landside toe, Second Street & E Street
Coordinates: North 1,975,545.01 East 6,701,983.81
Levee Station or Milepost: 1290+96/LM 3.11-MA 4-1
GPS: Latitude 38°35'08.96221"N Longitude 121°30'32.79295"W
Channel / River Name / Feature: Sacramento River
County: Yolo

LOG OF BORING
WM0004_031B

Engineering Support Services
Urban Levee Geotechnical Evaluations Program

Elevation, feet	Depth, feet	Material Graphics	FIELD CLASSIFICATION OF MATERIALS (Description)	Sample Location	Sample Number	Recovery, %	Blows per 6 in.	Blows per Foot	N_{60}(ASTM)	PP or TV, tsf	LABORATORY DATA: Water Content, %	LABORATORY DATA: Liquid Limit	LABORATORY DATA: Plasticity Index	LABORATORY DATA: Fines, % < #200	REMARKS
	20				7	67	3 5 5	10	14		35			36	S007A_020_022S
	21														
5	22		Poorly Graded SAND with Silt (SP-SM); loose to medium dense; very dark greenish gray (10BG 3/1); moist; 90% fine sand; 10% fines; weak cementation.		8	57									S008A_021_025P
	23														
	24														
	25		At 25 feet same as above except sand grades coarser slightly.		9	72	4 5 7	12	17		27			10	S009A_025_027S
	26														
0	27				10	71									S010A_027_030P
	28														
	29														
	30				11	100	5 6 6	12	17						S011A_030_032S
	31														
-5	32				12	71									S012A_032_035P
	33														
	34														
	35				13		5 8 7	15	21		27			10	S013A_035_037S
	36														
-10	37				14	71									S014A_037_040P
	38														
	39														
	40				15	100	7 9 9	18	25						S015A_040_042S
	41														
-15	42				16	86									S016A_042_045P
	43														
	44														
	45														

Borehole Location: 160' away from landside toe, Second Street & E Street
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LOG OF BORING
WM0004_031B

Engineering Support Services
Urban Levee Geotechnical Evaluations Program

Elevation, feet	Depth, feet	Material Graphics	FIELD CLASSIFICATION OF MATERIALS (Description)	Sample Location	Sample Number	Recovery, %	Blows per 6 in.	Blows per Foot	N_{60}(ASTM)	PP or TV, tsf	LABORATORY DATA: Water Content, %	LABORATORY DATA: Liquid Limit	LABORATORY DATA: Plasticity Index	LABORATORY DATA: Fines, % < #200	REMARKS
	45		At 45 feet same as above except 94% fine to coarse sand; 6% fines.		17	72	6 9 10	19	27		20			6	S017A_045_047S
-20	46														
	47				18	43									S018A_047_050P
	48														
	49														
	50				19	83	5 6 10	16	22						S019A_050_052S
-25	51														
	52				20	71									S020A_052_055P
	53														
	54														
	55		Poorly Graded SAND (SP); dense; very dark greenish gray (10BG 3/1); moist; 95% fine to coarse sand; trace fines and gravel.		21	83	8 11 15	26	36		20			4	S021A_055_057S
-30	56														
	57				22	14									S022A_057_060P
	58														
	59														
	60		Poorly Graded SAND with Gravel (SP); medium dense; very dark greenish gray (10Y 3/1); moist; 70% fine to coarse sand; 26% gravel, max. 2 in.; trace fines.		23	67	7 6 7	13	18		19			4	S023A_060_062S
-35	61														
	62					0									No recovery
	63														
	64														
	65		At 65 feet same as above except dense.		24	67	7 19 13	32	45						S024A_065_067S
-40	66														
	67		Poorly Graded GRAVEL with Silt and Sand (GP-GM); very dense; very dark greenish gray (5G 3/1); moist; 68% fine to coarse gravel, max. 1.5 in.; 25% sand; 6.5% fines.			0									No recovery
	68														
	69														
	70														

DEPARTMENT OF WATER RESOURCES — STATE OF CALIFORNIA

Borehole Location: 160' away from landside toe, Second Street & E Street
Coordinates: North 1,975,545.01 East 6,701,983.81
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GPS: Latitude 38°35'08.96221"N Longitude 121°30'32.79295"W
Channel / River Name / Feature: Sacramento River
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LOG OF BORING
WM0004_031B

Engineering Support Services
Urban Levee Geotechnical Evaluations Program

Elevation, feet	Depth, feet	Material Graphics	FIELD CLASSIFICATION OF MATERIALS (Description)	Sample Location	Sample Number	Recovery, %	Blows per 6 in.	Blows per Foot	N_{60}(ASTM)	PP or TV, tsf	LABORATORY DATA: Water Content, %	LABORATORY DATA: Liquid Limit	LABORATORY DATA: Plasticity Index	LABORATORY DATA: Fines, % < #200	REMARKS
	70					0	45 >50								No recovery 50/2"
-45	71														
	72														No recovery
	73					0									
	74														
	75														
	76					0	45 >50								No recovery 50/3"
-50	77														No recovery
	78					0									
	79														
	80														
	81				25	56	45 >50				5			7	S025A_080_082S 50/5"
-55	82														No recovery
	83					0									
	84														
	85		Poorly Graded SAND with Gravel (SP); very dense; very dark greenish gray (10Y 3/1); moist; 49% fine to medium sand; 47% gravel, max. 1 in.; trace fines.		26B 26A	100	8 32 31	63			13			3	S026B_085_087M S026A_085_087M
-60	86														
	87														No recovery
	88		LEAN CLAY with Sand (CL); stiff; dark yellowish brown (10YR 4/6); moist; 90% medium plasticity, medium dry strength, slow dilatancy, medium toughness fines; 10% fine sand; no reaction with HCl.			0									
	89														
	90														
	91				27B 27A	83	10 19 19	38		1.0P	32	35	13	90	S027B_090_092M S027A_090_092M
-65	92														S028A_092_095P
	93				28	57									
	94														
	95														

Borehole Location: 160' away from landside toe, Second Street & E Street
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Channel / River Name / Feature: Sacramento River
County: Yolo

LOG OF BORING
WM0004_031B

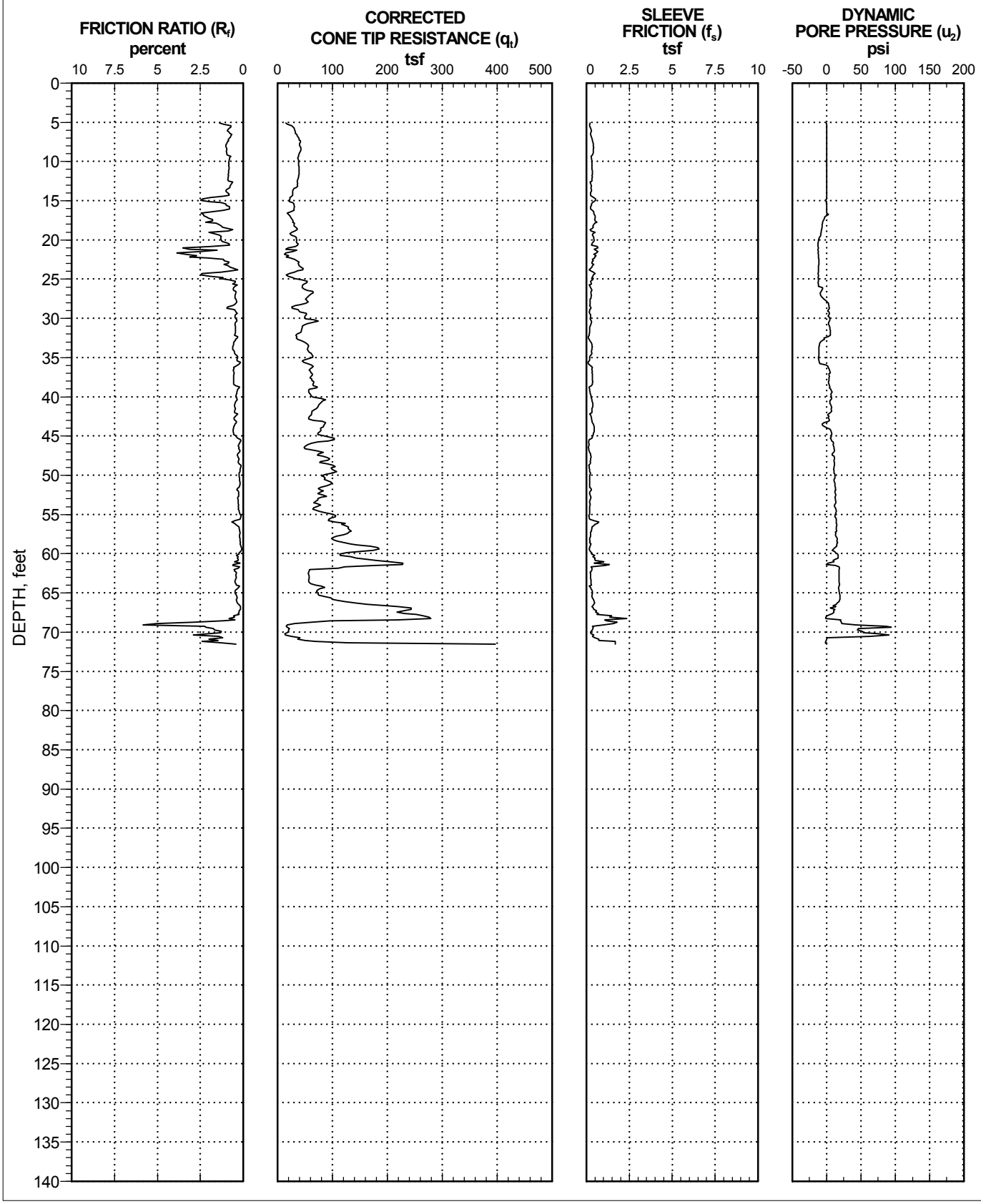
Engineering Support Services
Urban Levee Geotechnical Evaluations Program

Elevation, feet	Depth, feet	Material Graphics	FIELD CLASSIFICATION OF MATERIALS (Description)	Sample Location	Sample Number	Recovery, %	Blows per 6 in.	Blows per Foot	N_{60}(ASTM)	PP or TV, tsf	LABORATORY DATA				REMARKS
											Water Content, %	Liquid Limit	Plasticity Index	Fines, % < #200	
	95		Bottom of boring at 95.0 feet below ground surface (bgs)												
-70	96														
	97														
	98														
	99														
	100														
	101														
-75	102														
	103														
	104														
	105														
	106														
-80	107														
	108														
	109														
	110														
	111														
-85	112														
	113														
	114														
	115														
	116														
-90	117														
	118														
	119														
	120														

Borehole Location: 160' away from landside toe, Second Street & E Street
Coordinates: North 1,975,545.01 East 6,701,983.81
Levee Station or Milepost: 1290+96/LM 3.11-MA 4-1
GPS: Latitude 38°35'08.96221"N Longitude 121°30'32.79295"W
Channel / River Name / Feature: Sacramento River
County: Yolo

LOG OF BORING
WM0004_031B
Sheet 5 of 5

Engineering Support Services
Urban Levee Geotechnical Evaluations Program

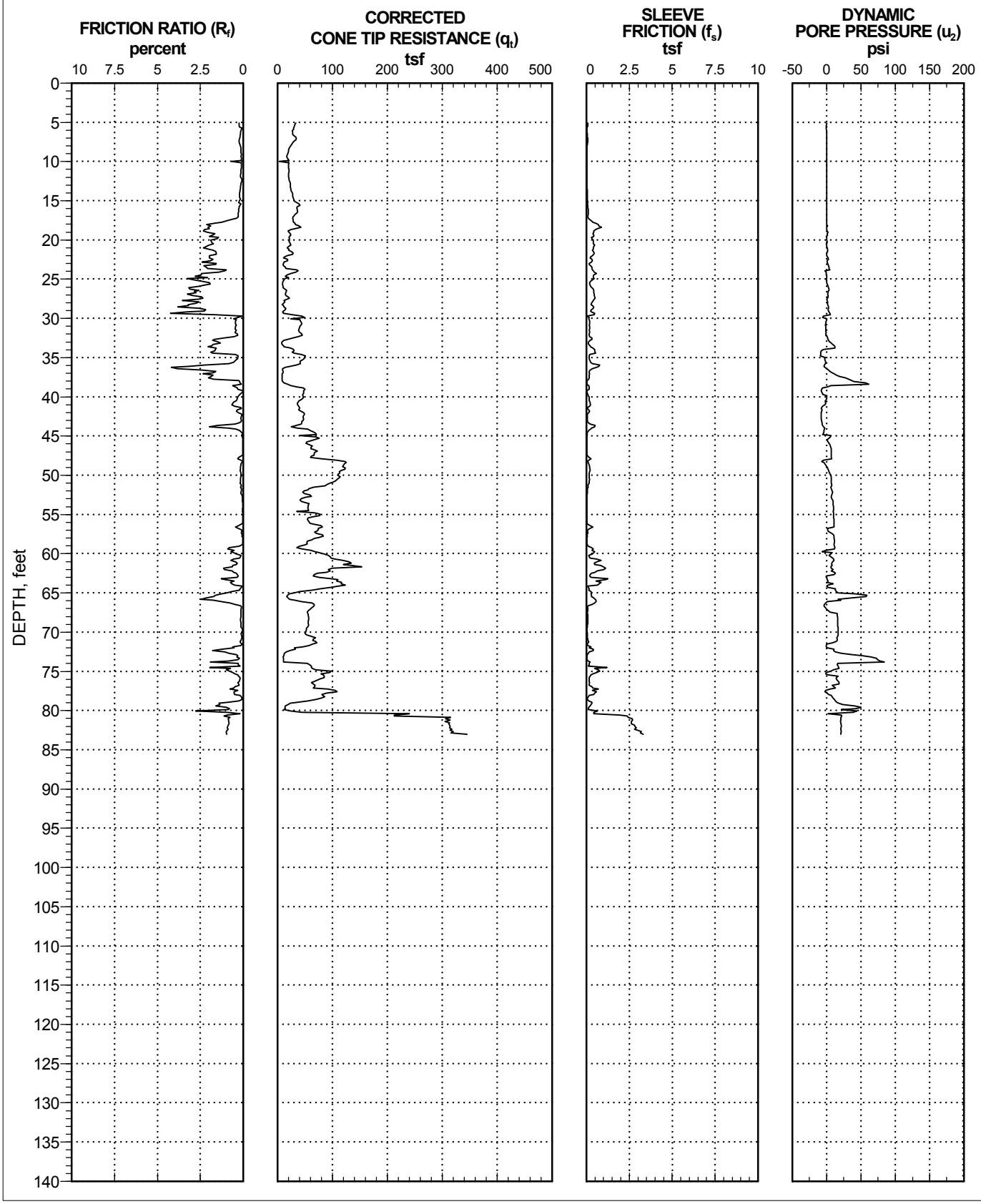


CPT IN LOG FORMAT GTLEVEEPROJECT071408 FINAL P1GDR.GPJ DWR LEVEES 111507.GDT 7/14/08

Exploration Location: 85' from landside levee toe, NE Corner of E St. & 2nd St
Performed by: Gregg Drilling & Testing, Inc. 1/24/2007
Coordinates: North 1,975,542.6 East 6,701,991.1
Levee Station or Milepost: 1290+94/LM 3.11-MA 4-1
GPS: Latitude 38°35'08.93779"N Longitude 121°30'32.70070"W
Channel / River Name / Feature: Sacramento River
County: Yolo

CPT Sounding
WM0004_031C
Sheet 1 of 1

Engineering Support Services
Urban Levee Geotechnical Evaluations
Program



CPT IN LOG FORMAT SACRAMENTO LEVEE 122908.GPJ DWR_LEVEES_070808.GDT 12/29/08

Exploration Location: Levee Crest
Performed by: Gregg Drilling & Testing, Inc. 3/13/2008
Coordinates: North 1,976,763.1 East 6,703,159.8
Levee Station or Milepost: 1027+29.57
GPS: Latitude 38.58915 Longitude 121.50497
Channel / River Name / Feature: Sacramento River
County: Sacramento

CPT Sounding (Seismic)
WSESAR_002C
Sheet 1 of 2

Engineering Support Services
Urban Levee Geotechnical Evaluations Program

FED. ROAD DIST. NO.	STATE	F. A. PROJECT NO.	SHEET NO.	TOTAL SHEETS
7	CALIF.			

DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
03	Sac	5	23.3/24.4	418	445

DATE APPROVED December 2, 1966

AS BUILT PLANS
Contract No. 03-061734
Date Completed 3-21-69
Document No. 30000217

AS BUILT
CORRECTIONS BY Pat O'Halloran
CONTRACT NO. 03-061734
DATE 1-30-69 jd 8/20/69

PLAN
1"=100'

"A" LINE
"B" LINE
"B1" LINE

B-104 B-19 B-21 B-22 B-23 B-24 B-25

550' Lt. "B" 570+12
96' Rt. "B" 570+32
75' Lt. "B" 572+42
72' Rt. "B" 574+23
49' Lt. "B" 575+55
138' Rt. "B" 577+15

B-104 5/12 2.5
B-19 30± 2.5
B-21 29± 2.5
B-22 30± 2.5
B-23 30± 2.5
B-24 29± 2.5

30 Brown fine sand with rubble. (Fill)
Compact brown fine sand with rubble. (Fill)
20 Very loose brown fine sandy silt to slightly compact blue-gray silty fine sand with wood particles. Loose gray silt.
10 GWS @ El. 16± 1-6-65
0 Slightly compact gray Silt with silty sand lenses.
-10 Compact to slightly compact gray clean sand.
-20 Slightly compact gray slightly silty medium sand with organic matter.
-30 Compact to slightly compact silty to clean sand with some organic matter - wood & gravel
-40 Slightly compact gray clean sand - some gravel.
-50 Very dense gray clean medium to coarse sand - some gravel.
-60 Slightly compact to compact gray clean sand with gravel layers.
-70 Very dense sand & gravel.
-80 Compact to dense brown & tan sand & gravel.
-90

GWS @ El. 16± 12-8-60
GWS @ El. 17± 12-8-60
GWS @ El. 17± 12-30-64
GWS @ El. 18± 12-29-64

12-5-60 1-6-65
12-29-64
12-28-64
1-6-65

300 200 100 0 100 200 300

Medium to coarse sand with cobbles - Fill.
Loose brown fine to coarse sand with pebbles & cobbles - Fill.
Loose brown medium to fine sand - micaceous.
Very loose to loose reddish-brown fine sandy silt to medium to fine sand.
Slightly compact light brown coarse sand.
Slightly compact brownish-gray medium to coarse sand.
Slightly compact to compact dark gray medium to coarse sand.
Slightly compact dark gray medium to coarse sand with some clay binder & pebbles.
Compact gray-brown fine to medium sand.
Compact dark gray medium to coarse sand with scattered pebbles.
Very dense dark grey-brown gravel with coarse sand.
Very dense dark gray-brown gravel with interbedded dense sand layers.
Compact gray-brown sandy gravel.
Very dense brown to white coarse to medium sand.

Loose black silty gravel - Fill. Brownish-black gravelly silt - Fill.
Compact light brown sandy silt - Fill.
Slightly compact dark brown fine sandy silt.
Very loose brown fine sandy silt.
Slightly compact brown fine to medium sand to light gray-brown medium sand.
Slightly compact light gray fine sand.
Log
Slightly compact dark gray medium to coarse sand.
Slightly compact dark gray medium to coarse sand with some silt binder.
Slightly compact gray medium to coarse sand to medium sand.
Compact gray medium to coarse sand.
Dense to very dense gray coarse sand & gravel interbedded with small sand layers.
Loose gray medium to coarse sand.
Very dense gray coarse sand & gravel.
Very dense gray medium to coarse sand with silt binder some gravel below Elev. -60.
Dense light brown medium & coarse sand with some binder.
1-6-65

570 571 572 573 574 575 576 577

PROFILE
VERT. 1"=10'
HORIZ. 1"=30'

LEGEND OF BORING OPERATIONS

Penetrometer
2½" Core Penetrometer
Sampler boring (dry)
Rotary boring (wet)
Auger boring (dry)
Jet boring
Core boring
Test pit

Penetration Resistance
Blows per foot (Standard 2" O.D. Sampler driven with 140 lb. hammer falling 30" unless otherwise noted)
Blows per foot (Standard 2½" O.D. Core Barrel driven with 140 lb. hammer falling 30" unless otherwise noted)
Pulled out
Distribution of material (Not subjected to penetration)
Distribution Test
Undisturbed material change
Undisturbed material change
Approximate material change
Boring Number
Elevation
Top Hole El.
Ceiling elevation
Base of pavement
Base of concrete
Base of asphalt
Base of rock fill
Base of miscellaneous material
Unidentified material
Unconformable material change
Shear strength (psf)
Unconfined compression test (psf)
Shear strength (psf)
Unconfined compression test (psf)
Bottom Hole El.
Bottom of boring
Bedrock Formation
Pleistocene Formation
1" Soil Tube

LEGEND OF EARTH MATERIALS

Gravel
Sand
Silt
Clay
Silty Clay or Clayey Silt
Peat Humus or Organic Matter
Fill Material
Igneous Rock
Sedimentary Rock
Metamorphic Rock
Shear Str. or Silty Sand
Shear Str. or Clayey Silt or Silty Clay

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

Particles behind the sieve the diameter of which is specified as inches or millimeters.
Separation of Class Names.
Words in the term "gravelly" may be substituted for the word "and" in the terms "coarse sand and fine gravel" and "fine gravel and coarse sand".
Terms "coarse," "medium" and "fine" may be used to modify "sand" and "gravel".
Refer to the Unified Soil Classification System for Silt and Gravel.
Refer to Grade Size Limits.

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

FIELD STUDY	by F. Nelson 1-65	
DRAWN	by F. Nelson 2-25-65	
CHECKED	by T. Nelson 2-25-65	
CROSS CHECKED		

Approved Recommended for Approval
Bridge Engineer

BRIDGE DEPARTMENT
ENGINEERING GEOLOGY SECTION

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STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

SHEET 279 OF 281

WEST END VIADUCT

LOG OF TEST BORINGS NO. 5

SCALE As Noted | BRIDGE 24-69 R/L | FILE | DRAWING 2469-45

Disregard prints bearing earlier numbers → PREL. DRAWING NO. PR- 961 1/2 61

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FED. ROAD DIST. NO.	STATE	F. A. PROJECT No.	SHEET NO.	TOTAL SHEETS
7	CALIF.			

DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
09	Sac.	5	23.9/R24.4	419	445

Date Approved December 2, 1966

AS BUILT PLANS
Contract No. 03-061734
Date Completed 3-21-69
Document No. 220002217

AS BUILT
PLANS
INSPECTIONS BY... PAT O'HALLORAN
CONTRACT NO. 03-061734
DATE 1-30-68 rjd 9/20/69

LEGEND OF BORING OPERATIONS

Piezometer
P.S. Cone Penetrometer
Sample Boring (Sw)
Rotary Boring (Rw)
Auger Boring (Aw)
Jet Boring
Core Boring
Test Pit

Portable drill rig
Typical Rotary Boring
Typical Auger Boring
1" Soil Tube

LEGEND OF EARTH MATERIALS

Gravel — Silty Clay or Clayey Silt
Sand — Organic Matter
Silt — Fill Material
Clay — Igneous Rock
Sandy Clay or Clayey Sand — Sedimentary Rock
Silty Sand or Silty Gravel — Metamorphic Rock

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

Diagram showing the sizes (in millimeters and inches) and corresponding sieve numbers used to designate the limits of boulders, cobbles, gravel, coarse sand, medium sand, fine sand, and silt or clay. Particles are designated as coarse, medium or fine within the limits of each of the above terms except silt or clay. Particles smaller than the standard sieve size are designated as silt or clay.

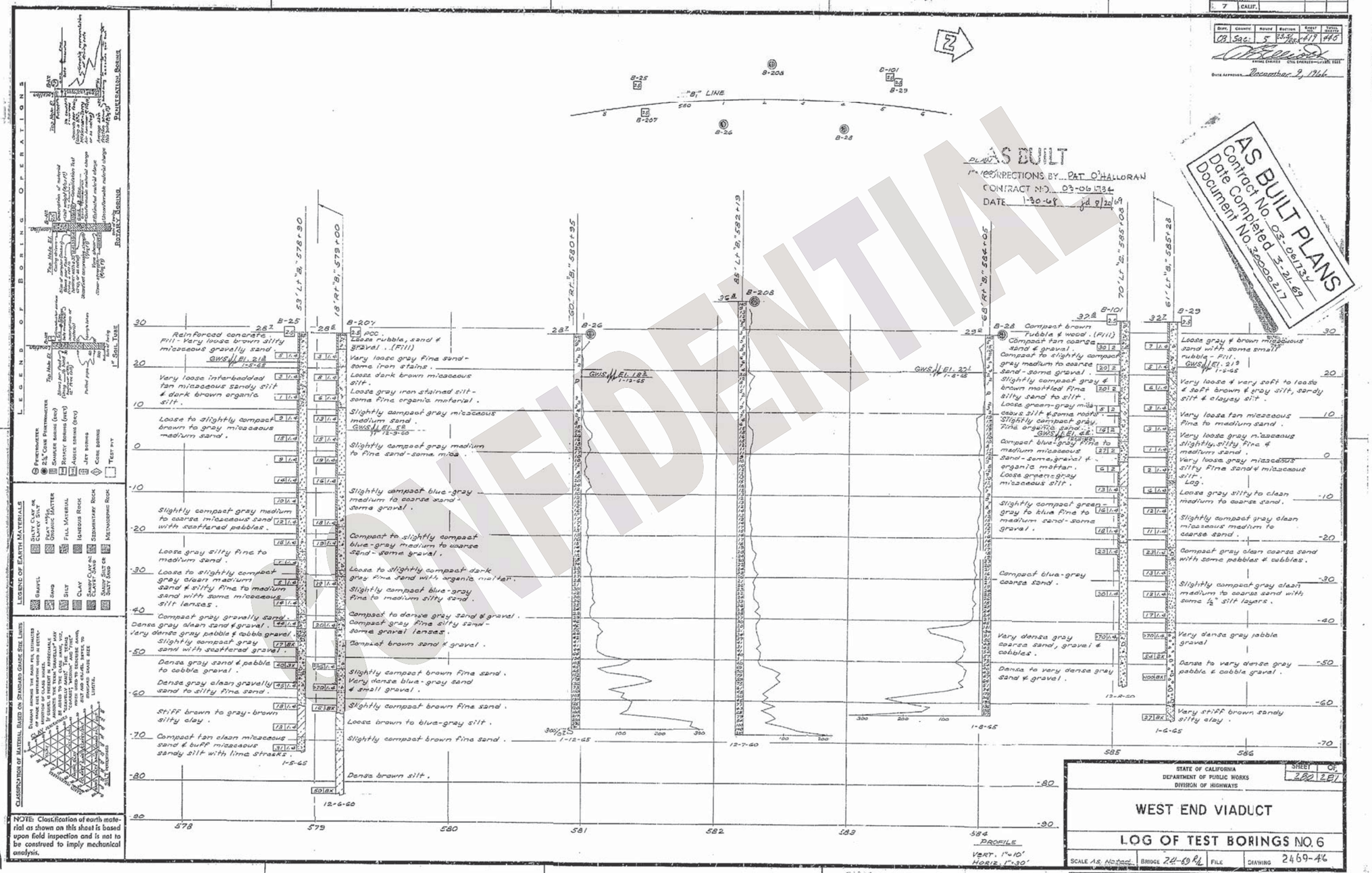
NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

FIELD STUDY	W. T. Nelson 1-27-66
DRAWN	W. K. Endow 1-27-66
CHECKED	W. T. Nelson 2-10-66

Approved Recommended by: John L. Beaudoin Bridge Engineer

BRIDGE DEPARTMENT
ENGINEERING GEOLOGY SECTION

419



STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

SHEET 280 OF 287

WEST END VIADUCT

LOG OF TEST BORINGS NO. 6

SCALE AS NOTED | BRIDGE 24-69 R/L | FILE | DRAWING 2469-46

Disregard prints bearing earlier numbers → PREL. DRAWING NO. PR- 96/84/61

CONFIDENTIAL

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LOG OF BORING B17-09

FILE NO.: 1698.1
PROJECT: Railyards Boulevard Improvements
LOCATION: Sacramento, CA
CLIENT: KHA

DRILLING DATE: 2/2/09
DRILLING METHOD: 6" Hollow Stem Auger
HAMMER TYPE: Automatic
LOGGED BY: ARS CHECKED BY: WEN

ELEVATION: 23.2 ft.
WATER DEPTH: 21 ft.
DATE OF READING:
TIME OF READING:

FIELD						LABORATORY						
DEPTH (FEET)	SAMPLE	SAMPLE NO.	BLOWS PER FT.	POCKET PEN (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	% <200 SIEVE	PLASTICITY INDEX	LIQUID LIMIT	UNCONFINED COMPRESSIVE STRENGTH (TSF)	ADDITIONAL TESTS
						Poorly-graded SAND (SP); loose, gray, dry, fine to medium sand							
		1	8				90	6					
5		2 Bag A	4			reddish brown, moist							
		3	3				83	5					
10		4	8				92	5					
15		5	9										
		6	5			very thin lense SANDY SILT (ML), reddish brown							
20		7	5			very loose							
		8	8			dark gray, wet							

LOG OF BOREHOLE 1698.1 RAILYARD BLVD LOGS.GPJ BLACKBRN.GDT 3/17/10

LOG OF BORING B17-09

FILE NO.: 1698.1
PROJECT: Railyards Boulevard Improvements
LOCATION: Sacramento, CA
CLIENT: KHA

DRILLING DATE: 2/2/09
DRILLING METHOD: 6" Hollow Stem Auger
HAMMER TYPE: Automatic
LOGGED BY: ARS CHECKED BY: WEN

ELEVATION: 23.2 ft.
WATER DEPTH: 21 ft.
DATE OF READING:
TIME OF READING:

FIELD						DESCRIPTION	LABORATORY						
DEPTH (FEET)	SAMPLE	SAMPLE NO.	BLOWS PER FT.	POCKET PEN (TSF)	GRAPHIC LOG		DRY DENSITY (PCF)	MOISTURE CONTENT (%)	% <200 SIEVE	PLASTICITY INDEX	LIQUID LIMIT	UNCONFINED COMPRESSIVE STRENGTH (TSF)	R-VALUE
		G	19			Poorly-graded SAND (SP), very loose, dark gray, wet							
						End of Boring at 26.5 ft Ground water encountered at 21 ft Backfilled with neat cement grout Bulk Bag A (5.0-10.0 ft)							

LOG OF BOREHOLE 1698.1 RAILYARD BLVD LOGS.GPJ BLACKBRN.GDT 3/18/10

LOG OF BORING B18-09

FILE NO.: 1698.1
PROJECT: Railyards Boulevard Improvements
LOCATION: Sacramento, CA
CLIENT: KHA

DRILLING DATE: 2/2/09
DRILLING METHOD: 6" Hollow Stem Auger
HAMMER TYPE: Automatic
LOGGED BY: ARS CHECKED BY: WEN

ELEVATION: 27.8 ft.
WATER DEPTH: 26 ft.
DATE OF READING:
TIME OF READING:

FIELD						LABORATORY						
DEPTH (FEET)	SAMPLE	SAMPLE NO.	BLOWS PER FT.	POCKET PEN (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	% <200 SIEVE	PLASTICITY INDEX	LIQUID LIMIT	UNCONFINED COMPRESSIVE STRENGTH (TSF)	ADDITIONAL TESTS
		Bag A				SILTY SAND (SM); loose, brown, moist							
		1	15				107	8					
						Poorly-graded SAND (SP); loose, gray, moist							
5		2	9				90	6					
10		3	8										
		4	4				83	5					
						Elastic SILT (MH); soft, olive brown, moist, with rootlets							
15		5	6				72	46	96	22	50		
						SILTY SAND (SM); loose, dark olive brown, fine sand							
20		6	10										
		7	7										

LOG OF BOREHOLE 1698.1 RAILYARD BLVD LOGS.GPJ BLACKBRN.GDT 3/17/10

LOG OF BORING B18-09

FILE NO.: 1698.1
PROJECT: Railyards Boulevard Improvements
LOCATION: Sacramento, CA
CLIENT: KHA

DRILLING DATE: 2/2/09
DRILLING METHOD: 6" Hollow Stem Auger
HAMMER TYPE: Automatic
LOGGED BY: ARS CHECKED BY: WEN

ELEVATION: 27.8 ft.
WATER DEPTH: 26 ft.
DATE OF READING:
TIME OF READING:

FIELD						LABORATORY						
DEPTH (FEET)	SAMPLE	SAMPLE NO.	BLOWS PER FT.	POCKET PEN (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	% <200 SIEVE	PLASTICITY INDEX	LIQUID LIMIT	UNCONFINED COMPRESSIVE STRENGTH (TSF)	R-VALUE
		8	4			SILTY SAND (SM); loose, dark olive brown, fine sand	74	38					
						SILTY CLAY (CL-ML); soft, dark brown, moist to wet							
						Poorly-graded SAND (SP); loose, dark gray, wet, fine to medium sand							
30		9	16										
		10	12										
						End of Boring at 33 ft Ground water encountered at 26 ft Backfilled with 31 ft with neat cement grout and 2 ft cuttings (as approved by Sacrament County) Bulk Bag A (0-5.0 ft)							

LOG OF BOREHOLE 1698.1 RAILYARD BLVD LOGS.GPJ BLACKBRN.GDT 3/18/10

LOG OF BORING B19-09

FILE NO.: 1698.1
PROJECT: Railyards Boulevard Improvements
LOCATION: Sacramento, CA
CLIENT: KHA

DRILLING DATE: 2/6/09
DRILLING METHOD: 6" Hollow Stem Auger
HAMMER TYPE: Automatic
LOGGED BY: ARS CHECKED BY: WEN

ELEVATION: 28.9 ft.
WATER DEPTH:
DATE OF READING:
TIME OF READING:

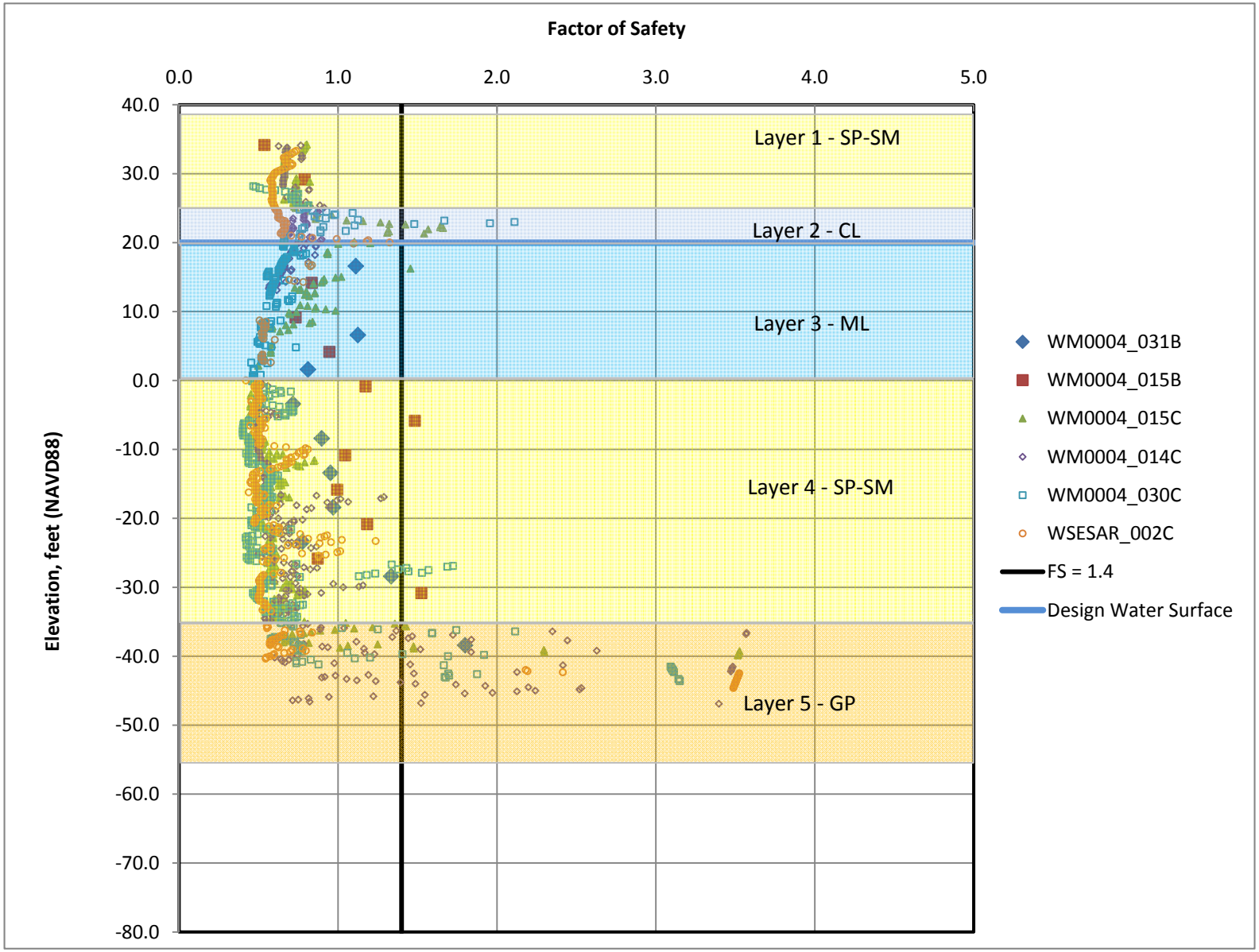
blackburn consulting

FIELD						LABORATORY						
DEPTH (FEET)	SAMPLE	SAMPLE NO.	BLOWS PER FT.	POCKET PEN (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	% <200 SIEVE	PLASTICITY INDEX	LIQUID LIMIT	UNCONFINED COMPRESSIVE STRENGTH (TSF)	ADDITIONAL TESTS
		1	24			Poorly-graded SAND with GRAVEL (SP); medium dense, very dark brown to black, moist, fine to coarse sand	98	11					
5		2	9										
		3	6			loose, olive brown	111	4					
						fine to medium sand							
10		4	8				89	6					
15		5	12										
		6	12			SILT (ML); firm, reddish brown, moist	88	33		19	47		
						End of Boring at 18 ft No ground water encountered Backfilled with neat cement grout							

LOG OF BOREHOLE 1698.1 RAILYARD BLVD LOGS.GPJ BLACKBRN.GDT 3/17/10

Appendix IV – Liquefaction Analysis

Summary of Liquefaction Susceptibility



Project: I Street Bridge Replacement
Client: Mark Thomas and Company
Subject: EQ Analysis - I Street Bridge

Factors of Safety against Liquefaction
WM0004_002C - I Street Bridge, Sacramento

Purpose: Evaluate susceptibility of sand-like soils to liquefaction.

Method: Use the "simplified procedure" practice for evaluating liquefaction of resistance of soils based on CPT results. The equations are based on the technical update presented in Reference 1 and are listed at the end of the spreadsheet.

References:
1) Youd, T. L. et al. (2001). "Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils". J. Geotech. and Geoenv. Engrg., ASCE, 127(4):297-313.

Assumptions:

Unit Wt. of Sand, Silt & Gravel above GWT, γ [pcf]	130.0	Assumed value based on coarser-grained units close to the ground surface
Unit Wt. of Sand, Silt & Gravel below GWT, γ [pcf]	120.0	Assumed value based on finer-grained units further from the ground surface
Earthquake magnitude	7	Magnitude is assumed based off previous WSAFCA Study
Depth to Groundwater at Time of Drilling (ft)	14.6	
Depth to Groundwater for Design (ft)	18.4	
Ground Surface Elevation	38.40	Ground Surface Elevation Listed on CPT log
Earthquake PGA (g)	0.262	

Youd et al 2001 Eqn. No.	Equation
12, 13	$q_{c1N} = C_Q(q_c/p_{atm})$ where $C_Q = (p_{atm}/\sigma'_{vo})^n$
18, 19	$q_{c1Ncs} = K_c q_{c1N}$ where $K_c = -0.403I_c^4 + 5.581I_c^3 - 21.63I_c^2 + 33.75I_c - 17.88$ for $I_c > 1.64$; $K_c = 1.0$ for $I_c <= 1.64$
11a,b	$CRR_{7.5} =$ $0.833(q_{c1Ncs}/1000) + 0.05$ for $q_{c1Ncs} < 50$; $93(q_{c1Ncs}/1000)^3 + 0.08$ for $50 \le q_{c1Ncs} < 160$; 0.60 for $q_{c1Ncs} \ge 160$
1	$CSR = \tau_{av} / \sigma'_{vo,b} = 0.65\,(a_{max}/g)(\sigma_{o,t,b}/\sigma'_{vo,b})r_d$
24	$MSF = 10^{2.24} / Mw^{2.56}$
31	$K_\sigma = [(\sigma'_v)_b / P_a]^{(f-1)}$ where f = 0.75 for an assumed relative density of 50%
30	$FS = (CRR_{7.5} / CSR) * MSF * K_\sigma$

Notes:
1) Yellow cells = cell which is input by the user (cells not highlighted are computed by Excel).
2) Qt1 is the normalized cone tip resistance for an exponent n equal to 1.0. This is also equal to the conventional normalized tip resistance, Q, as has been previously used (e.g. Robertson 1990).
3) Ic (n=1) indicates that the soil behavior type index Ic is calculated by assuming n is equal to 1.0. Ic is defined in equation 14 of Youd et al. 2001.
4) $(\sigma'_{vo})_a$ is the vertical effective stress computed using the depth to water at the time of drilling.
5) $(\sigma'_v)_b$ is the vertical effective sress computed using the depth to water during the earthquake.
6) If Ic (n=1) is less than 2.6 and the updated Ic (column Q) is greater than 2.6, set n to 0.7 and recalculate Qtn and Ic
7)
8) Ic < 2.6 is the nominal range of liquefiable soils, per the Robertson and Wride (1998) method.
9) Data points with Ic > 2.6 are included in the triggering evaluations if the exponent n is manually set to 0.7 to be consistent with SPT or laboratory classification of soils.

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
							Note 4		Note 2	Note 3				Note 6									Note 5						Note 8		Note 9
	5.09	33.3	33.4	0.08	0.23	661	661	1.7	100	1.6	0.50	55.87	1.8	FALSE	0.5	55.9	1.8	1.1	57	64	0.104	661	661	0.99	0.17	1.00	1.19	0.74	Yes	No	No
	5.25	33.2	31.9	0.08	0.24	682	682	1.7	93	1.6	0.50	52.58	1.8	FALSE	0.5	52.6	1.8	1.1	54	62	0.102	682	682	0.99	0.17	1.00	1.19	0.72	Yes	No	No
	5.41	33.0	30.4	0.07	0.23	704	704	1.7	86	1.6	0.50	49.31	1.9	FALSE	0.5	49.3	1.9	1.2	52	60	0.100	704	704	0.99	0.17	1.00	1.19	0.71	Yes	No	No
	5.58	32.8	29.7	0.07	0.22	725	725	1.7	81	1.7	0.50	47.30	1.9	FALSE	0.5	47.3	1.9	1.2	50	59	0.099	725	725	0.99	0.17	1.00	1.19	0.70	Yes	No	No
	5.74	32.7	29.3	0.02	0.07	746	746	1.7	78	1.6	0.50	46.08	1.8	FALSE	0.5	46.1	1.8	1.1	49	55	0.096	746	746	0.99	0.17	1.00	1.19	0.68	Yes	No	No
	5.91	32.5	28.9	0.03	0.10	768	768	1.7	74	1.6	0.50	44.82	1.8	FALSE	0.5	44.8	1.8	1.1	48	54	0.095	768	768	0.99	0.17	1.00	1.19	0.67	Yes	No	No
	6.07	32.3	26.8	0.03	0.12	789	789	1.6	67	1.7	0.50	40.88	1.9	FALSE	0.5	40.9	1.9	1.2	44	51	0.093	789	789	0.99	0.17	1.00	1.19	0.66	Yes	No	No
	6.23	32.2	27.6	0.04	0.15	810	810	1.6	67	1.7	0.50	41.48	1.9	FALSE	0.5	41.5	1.9	1.2	45	53	0.094	810	810	0.99	0.17	1.00	1.19	0.66	Yes	No	No
	6.40	32.0	27.6	0.04	0.16	832	832	1.6	65	1.7	0.50	41.01	1.9	FALSE	0.5	41.0	1.9	1.2	44	53	0.094	832	832	0.99	0.17	1.00	1.19	0.67	Yes	No	No
	6.56	31.8	27.9	0.05	0.17	853	853	1.6	64	1.7	0.50	40.84	1.9	FALSE	0.5	40.8	1.9	1.2	44	53	0.094	853	853	0.98	0.17	1.00	1.19	0.67	Yes	No	No
	6.73	31.7	29.6	0.06	0.20	874	874	1.6	67	1.7	0.50	42.88	1.9	FALSE	0.5	42.9	1.9	1.2	46	55	0.096	874	874	0.98	0.17	1.00	1.19	0.68	Yes	No	No
	6.89	31.5	33.0	0.07	0.20	896	896	1.5	73	1.7	0.50	47.28	1.9	FALSE	0.5	47.3	1.9	1.2	51	59	0.099	896	896	0.98	0.17	1.00	1.19	0.71	Yes	No	No
	7.05	31.3	34.1	0.07	0.21	917	917	1.5	73	1.7	0.50	48.27	1.9	FALSE	0.5	48.3	1.9	1.2	52	60	0.100	917	917	0.98	0.17	1.00	1.19	0.71	Yes	No	No
	7.22	31.2	33.0	0.08	0.23	938	938	1.5	69	1.7	0.50	46.24	1.9	FALSE	0.5	46.2	1.9	1.2	50	59	0.099	938	938	0.98	0.17	1.00	1.19	0.71	Yes	No	No
	7.38	31.0	30.7	0.07	0.24	960	960	1.5	63	1.8	0.50	42.43	1.9	FALSE	0.5	42.4	1.9	1.2	46	56	0.096	960	960	0.98	0.17	1.00	1.19	0.69	Yes	No	No
	7.55	30.9	28.1	0.07	0.24	981	981	1.5	56	1.8	0.50	38.30	2.0	FALSE	0.5	38.3	2.0	1.3	41	53	0.094	981	981	0.98	0.17	1.00	1.19	0.67	Yes	No	No
	7.71	30.7	26.5	0.06	0.22	1002	1002	1.5	52	1.8	0.50	35.64	2.0	FALSE	0.5	35.6	2.0	1.3	38	50	0.092	1002	1002	0.98	0.17	1.00	1.19	0.65	Yes	No	No
	7.87	30.5	24.9	0.05	0.20	1024	1024	1.4	48	1.9	0.50	33.19	2.0	FALSE	0.5	33.2	2.0	1.3	36	47	0.090	1024	1024	0.98	0.17	1.00	1.19	0.64	Yes	No	No
	8.04	30.4	23.3	0.04	0.17	1045	1045	1.4	44	1.9	0.50	30.64	2.0	FALSE	0.5	30.6	2.0	1.3	33	45	0.087	1045	1045	0.98	0.17	1.00	1.19	0.62	Yes	No	No
	8.20	30.2	21.8	0.03	0.15	1066	1066	1.4	40	1.9	0.50	28.37	2.1	FALSE	0.5	28.4	2.1	1.4	31	42	0.085	1066	1066	0.98	0.17	1.00	1.19	0.61	Yes	No	No
	8.37	30.0	20.9	0.03	0.13	1088	1088	1.4	37	1.9	0.50	26.86	2.1	FALSE	0.5	26.9	2.1	1.4	29	41	0.084	1088	1088	0.98	0.17	1.00	1.19	0.60	Yes	No	No
	8.53	29.9	20.2	0.03	0.13	1109	1109	1.4	36	1.9	0.50	25.70	2.1	FALSE	0.5	25.7	2.1	1.4	28	40	0.083	1109	1109	0.98	0.17	1.00	1.19	0.60	Yes	No	No
	8.69	29.7	19.6	0.03	0.14	1130	1130	1.4	34	2.0	0.50	24.64	2.1	FALSE	0.5	24.6	2.1	1.5	27	39	0.083	1130	1130	0.98	0.17	1.00	1.19	0.59	Yes	No	No
	8.86	29.5	19.2	0.02	0.13	1152	1152	1.4	32	2.0	0.50	23.87	2.1	FALSE	0.5	23.9	2.1	1.5	26	39	0.082	1152	1152	0.98	0.17	1.00	1.19	0.59	Yes	No	No
	9.02	29.4	18.6	0.02	0.11	1173	1173	1.3	31	2.0	0.50	22.81	2.1	FALSE	0.5	22.8	2.1	1.5	25	38	0.081	1173	1173	0.98	0.17	1.00	1.19	0.58	Yes	No	No
	9.19	29.2	17.9	0.02	0.12	1194	1194	1.3	29	2.0	0.50	21.74	2.2	FALSE	0.5	21.7	2.2	1.6	24	37	0.081	1194	1194	0.98	0.17	1.00	1.19	0.58	Yes	No	No
	9.35	29.1	16.7	0.02	0.12	1216	1216	1.3	27	2.1	0.50	20.12	2.2	FALSE	0.5	20.1	2.2	1.6	22	36	0.080	1216	1216	0.98	0.17	1.00	1.19	0.57	Yes	No	No
	9.51	28.9	17.7	0.02	0.12	1237	1237	1.3	28	2.0	0.50	21.17	2.2	FALSE	0.5	21.2	2.2	1.6	23	37	0.081	1237	1237	0.98	0.17	1.00	1.19	0.58	Yes	No	No
	9.68	28.7	19.1	0.02	0.11	1258	1258	1.3	29	2.0	0.50	22.61	2.1	FALSE	0.5	22.6	2.1	1.5	25	37	0.081	1258	1258	0.98	0.17	1.00	1.19	0.58	Yes	No	No
	9.84	28.6	20.4	0.02	0.10	1280	1280	1.3	31	2.0	0.50	24.05	2.1	FALSE	0.5	24.1	2.1	1.5	26	38	0.082	1280	1280	0.98	0.17	1.00	1.19	0.59	Yes	No	No
	10.01	28.4	3.0	0.02	0.85	1301	1301	1.6	4	3.1	1.00	3.63	3.1	FALSE	1.0	3.6	3.1	8.3	5	41		1301	1301	0.98	0.17	1.00	1.19	100.00	No	No	No
	10.17	28.2	20.6	0.02	0.10	1322	1322	1.3	30	2.0	0.50	23.80	2.1	FALSE	0.5	23.8	2.1	1.5	26	38	0.082	1322	1322	0.98	0.17	1.00	1.19	0.59	Yes	No	No
	10.34	28.1	20.2	0.02	0.10	1344	1344	1.3	29	2.0	0.50	23.11	2.1	FALSE	0.5	23.1	2.1	1.5	25	38	0.081	1344	1344	0.98	0.17	1.00	1.19	0.58	Yes	No	No
	10.50	27.9	20.0	0.02	0.10	1365	1365	1.2	28	2.0	0.50	22.76	2.1	FALSE	0.5	22.8	2.1	1.5	25	37	0.081	1365	1365	0.98	0.17	1.00	1.19	0.58	Yes	No	No
	10.66	27.7	20.2	0.02	0.10	1386	1386	1.2	28	2.0	0.50	22.83	2.1	FALSE	0.5	22.8	2.1	1.5	25	38	0.081	1386	1386	0.98	0.17	1.00	1.19	0.58	Yes	No	No
	10.83	27.6	20.4	0.02	0.11	1408	1408	1.2	28	2.0	0.50	22.80	2.1	FALSE	0.5	22.8	2.1	1.5	25	38	0.081	1408	1408	0.97	0.17	1.00	1.19	0.59	Yes	No	No
	10.99	27.4	20.5	0.03	0.15	1429	1429	1.2	28	2.1	0.50	22.74	2.1	FALSE	0.5	22.7	2.1	1.5	25	39	0.082	1429	1429	0.97	0.17	1.00	1.19	0.59	Yes	No	No
	11.16	27.2	20.5	0.03	0.14	1450	1450	1.2	27	2.1	0.50	22.62	2.1	FALSE	0.5	22.6	2.1	1.5	25	38	0.082	1450	1450	0.97	0.17	1.00	1.19	0.59	Yes	No	No
	11.32	27.1	20.5	0.03	0.14	1471	1471	1.2	27	2.1	0.50	22.35	2.2	FALSE	0.5	22.4	2.2	1.6	25	38	0.082	1471	1471	0.97	0.17	1.00	1.19	0.59	Yes	No	No
	11.48	26.9	20.2	0.03	0.15	1493	1493	1.2	26	2.1	0.50	21.87	2.2	FALSE	0.5	21.9	2.2	1.6	24	38	0.082	1493	1493	0.97	0.17	1.00	1.19	0.59	Yes	No	No
	11.65	26.8	20.3	0.03	0.15	1514	1514	1.2	26	2.1	0.50	21.86	2.2	FALSE	0.5	21.9	2.2	1.6	24	38	0.082	1514	1514	0.97	0.17	1.00	1.19	0.59	Yes	No	No
	11.81	26.6	20.3	0.03	0.15	1535	1535	1.2	26	2.1	0.50	21.73	2.2	FALSE	0.5	21.7	2.2	1.6	24	38	0.082	1535	1535	0.97	0.17	1.00	1.19	0.59	Yes	No	No
	11.98	26.4	20.3	0.03	0.16	1557	1557	1.2	25	2.1	0.50	21.47	2.2	FALSE	0.5	21.5	2.2	1.6	24	38	0.082	1557	1557	0.97	0.17	1.00	1.19	0.59	Yes	No	No
	12.14	26.3	20.5	0.02	0.10	1578	1578	1.2	25	2.1	0.50	21.61	2.1	FALSE	0.5	21.6	2.1	1.5	24	37	0.081	1578	1578	0.97	0.17	1.00	1.19	0.58	Yes	No	No
	12.30	26.1	21.1	0.02	0.10	1599	1599	1.2	25	2.1	0.50	22.08	2.1	FALSE	0.5	22.1	2.1	1.5	24	37	0.081	1599	1599	0.97	0.17	1.00	1.19	0.58	Yes	No	No
	12.47	25.9	21.7	0.02	0.10	1621	1621	1.1	26	2.1	0.50	22.59	2.1	FALSE	0.5	22.6	2.1	1.5	25	37	0.081	1621	1621	0.97	0.17	1.00	1.19	0.59	Yes	No	No
	12.63	25.8	22.8	0.03	0.12	1642	1642	1.1	27	2.1	0.50	23.57	2.1	FALSE	0.5	23.6	2.1	1.5	26	39	0.082	1642	1642	0.97	0.17	1.00	1.19	0.59	Yes	No	No
	12.80	25.6	23.0	0.03	0.13	1663	1663	1.1	27	2.1	0.50	23.67	2.1	FALSE	0.5	23.7	2.1	1.5	26	39	0.082	1663	1663	0.97	0.17	1.00	1.19	0.59	Yes	No	No
	12.96	25.4	23.0	0.03	0.14	1685	1685	1.1	26	2.1	0.50	23.51	2.1	FALSE	0.5	23.5	2.1	1.5	26	39	0.082	1685	1685	0.97	0.17	1.00	1.19	0.60	Yes	No	No
	13.12	25.3	23.5	0.04	0.15	1706	1706	1.1	27	2.1	0.50	23.81	2.1	FALSE	0.5	23.8	2.1	1.5	26	40	0.083	1706	1706	0.97	0.17	1.00	1.19	0.60	Yes	No	No
	13.29	25.1	23.4	0.04	0.17	1727	1727	1.1	26	2.1	0.50	23.62	2.1	FALSE	0.5	23.6	2.1	1.5	26	40	0.083	1727	1727	0.97	0.17	1.00	1.19	0.60	Yes	No	No
	13.45	24.9	23.8	0.04	0.17	1749	1749	1.1	26	2.1	0.50	23.86	2.1	FALSE	0.5	23.9	2.1	1.5	26	40	0.083	1749	1749	0.97	0.16	1.00	1.19	0.60	Yes	No	No
	13.62	24.8	24.4	0.04	0.18	1770	1770	1.1	27	2.1	0.50	24.35	2.1	FALSE	0.5	24.3	2.1	1.5	27	41	0.084	1770	1770	0.97	0.16	1.00	1.19	0.61	Yes	No	No
	13.78	24.6	25.4	0.05	0.20	1791	1791	1.1	27	2.1	0.50	25.17	2.1	FALSE	0.5	25.2	2.1	1.5	28	42	0.085	1791	1791	0.97	0.16	1.00	1.19	0.61	Yes	No	No
	13.94	24.5	26.5	0.06	0.23	1813	1813	1.1	28	2.1	0.50	26.14	2.1	FALSE	0.5	26.1	2.1	1.5	29	43	0.086	1813	1813	0.97	0.16	1.00	1.19	0.62	Yes	No	No
	14.11	24.3	27.2	0.06	0.22	1834	1834	1.1	29	2.1	0.50	26.67	2.1	FALSE	0.5	26.7	2.1	1.5	29	44	0.086	1834	1834	0.97	0.16	1.00	1.19	0.63	Yes	No	No
	14.27	24.1	27.2	0.06	0.22	1855	1855	1.1	28	2.1	0.50	26.53	2.1	FALSE	0.5	26.5	2.1	1.5	29	44	0.086	1855	1855	0.97	0.16	1.00	1.19	0.63	Yes	No	No
	14.44	24.0	27.4	0.06	0.22	1877	1877	1.1	28	2.1	0.50	26.59	2.1	FALSE	0.5	26.6	2.1	1.5	29	43	0.086	1877	1877	0.97	0.16	1.00	1.19	0.63	Yes	No	No
	14.60	23.8	28.0	0.06	0.22	1898	1898	1.1	28	2.1	0.50	26.97	2.1	FALSE	0.5	27.0	2.1	1.5	30	44	0.086	1898	1898	0.97	0.16	1.00	1.19	0.63	Yes	No	No
	14.76	23.6	28.9	0.05	0.17	1918	1907	1.1	29	2.1	0.50	27.81	2.1	FALSE	0.5	27.8	2.1	1.4	30	43	0.086	1919	1918	0.97	0.16	1.00	1.19	0.62	Yes	No	No
	14.93	23.5	30.0	0.06	0.22	1937	1917	1.1	30	2.1	0.50	28.86	2.1	FALSE	0.5	28.9	2.1	1.4	32	45	0.088	1941	1937	0.97	0.16	1.00	1.19	0.63	Yes	No	No
	15.09	23.3	31.7	0.07	0.24	1957	1926	1.0	32	2.1	0.50	30.45	2.1	FALSE	0.5	30.4	2.1	1.4	33	47	0.089	1962	1957	0.96	0.16	1.00	1.19	0.64	Yes	No	No
	15.26	23.1	35.4	0.09	0.27	1977	1936	1.0	36	2.0	0.50	34.01	2.0	FALSE	0.5	34.0	2.0	1.4	37	50	0.092	1983	1977	0.96	0.16	1.00	1.19	0.67	Yes	No	No
	15.42	23.0	39.1	0.06	0.14	1996	1945	1.0	39	1.9	0.50	37.61	1.9	FALSE	0.5	37.6	1.9	1.2	41	50	0.092	2005	1996	0.96	0.16	1.00	1.19	0.66	Yes	No	No
	15.58	22.8	40.5	0.08	0.20	2016	1955	1.0	40	1.9	0.50	38.79	2.0	FALSE	0.5	38.8	2.0	1.2	42	52	0.093	2026	2016	0.96	0.16	1.00	1.19	0.67	Yes	No	No
	15.75	22.7	36.2	0.08	0.23	2036	1964	1.0	36	2.0	0.50	34.51	2.0	FALSE	0.5	34.5	2.0	1.3	38	50	0.092	2047	2036	0.96	0.16	1.00	1.19	0.66	Yes	No	No
	15.91	22.5	35.2	0.08	0.24	2055	1974	1.0	35	2.0	0.50	33.49	2.0	FALSE	0.5	33.5	2.0	1.3	36	49	0.091	2069	2055	0.96	0.17	1.00	1.19	0.66	Yes	No	No
	16.08	22.3	35.6	0.10	0.28	2075	1983	1.0	35	2.0	0.50	33.79	2.1	FALSE	0.5	33.8	2.1	1.4	37	51	0.092	2090	2075	0.96	0.17	1.00	1.19	0.66	Yes	No	No
	16.24	22.2	36.1	0.10	0.27	2095	1992	1.0	35	2.0	0.50	34.10	2.0	FALSE	0.5	34.1	2.0	1.4	37	51	0.092	2111	2095	0.96	0.17	1.00	1.19	0.67	Yes	No	No
	16.40	22.0	36.5	0.10	0.27	2114	2002	1.0	35	2.0	0.50	34.43	2.0	FALSE	0.5	34.4	2.0	1.4	38	51	0.092	2133	2114	0.96	0.17	1.00	1.19	0.67	Yes	No	No
	16.57	21.8	35.0	0.10	0.29	2134	2011	1.0	34	2.1	0.50	32.87	2.1	FALSE	0.5	32.9	2.1	1.4	36	50	0.092	2154	2134	0.96	0.17	1.00	1.19	0.66	Yes	No	No
	16.73	21.7	31.9	0.10	0.31	2154	2021	1.0	31	2.1	0.50	29.82	2.1	FALSE	0.5	29.8	2.1	1.5	33	49	0.090	2175	2154	0.96	0.17	1.00	1.19	0.65	Yes	No	No
	16.90	21.5	29.9	0.09	0.31	2174	2030	1.0	28	2.1	0.50	27.83	2.1	FALSE	0.5	27.8	2.1	1.5	31	47	0.089	2196	2174	0.96	0.17	1.00	1.19	0.64	Yes	No	No
	17.06	21.3	28.2	0.09	0.32	2193	2040	1.0	27	2.2	0.50	26.11	2.2	FALSE	0.5	26.1	2.2	1.6	29	46	0.089	2218	2193	0.96	0.17	1.00	1.19	0.64	Yes	No	No
	17.22	21.2	27.5	0.10	0.39	2213	2049	1.0	26	2.2	0.50	25.39	2.2	FALSE	0.5	25.4	2.2	1.7	28	48	0.090	2239	2213	0.96	0.17	1.00	1.19	0.65	Yes	No	No
	17.39	21.0	28.1	0.19	0.72	2233	2059	1.0	26	2.3	0.50	25.84	2.3	FALSE	0.5	25.8	2.3	2.0	28	58	0.098	2260	2233	0.96	0.17	1.00	1.19	0.70	Yes	No	No
	17.55	20.8	28.2	0.28	1.05	2252	2068	1.0	26	2.4	0.50	25.85	2.4	FALSE	0.5	25.8	2.4	2.3	28	66	0.107	2282	2252	0.96	0.17	1.00	1.19	0.77	Yes	No	No
	17.72	20.7	29.5	0.37	1.29	2272	2078	1.0	27	2.4	0.50	27.05	2.4	FALSE	0.5	27.0	2.4	2.5	30	73	0.116	2303	2272	0.96	0.17	1.00	1.19	0.84	Yes	No	No
	17.88	20.5	32.0	0.53	1.72	2292	2087	1.0	30	2.5	0.50	29.33	2.5	FALSE	0.5	29.3	2.5	2.6	32	85	0.138	2325	2292	0.96	0.17	1.00	1.19	0.99	Yes	No	No
	18.05	20.4	32.7	0.70	2.22	2311	2096	1.0	30	2.5	0.50	30.00	2.5	FALSE	0.5	30.0	2.5	3.0	33	97	0.165	2346	2311	0.96	0.17	1.00	1.19	1.19	Yes	No	No
	18.21	20.2	38.8	0.73	1.94	2331	2106	1.0	36	2.4	0.50	35.68	2.4	FALSE	0.5	35.7	2.4	2.5	39	97	0.164	2367	2331	0.96	0.17	1.00	1.19	1.18	Yes	No	No
	18.37	20.0	42.6	0.87	2.10	2351	2115	1.0	39	2.4	0.50	39.18	2.4	FALSE	0.5	39.2	2.4	2.4	43	104	0.184	2388	2351	0.96	0.17	1.00	1.19	1.32	Yes	No	No
	18.54	19.9	32.0	0.63	2.04	2370	2125	1.0	29	2.5	0.50	29.10	2.5	FALSE	0.5	29.1	2.5	2.9	32	92	0.153	2408	2362	0.96	0.17	1.00	1.19	1.10	Yes	Yes	Yes
	18.70	19.7	24.0	0.54	2.39	2390	2134	1.0	21	2.7	1.00	21.33	2.7	FALSE	1.0	21.3	2.7	3.8	24	90		2428	2371	0.96	0.17	1.00	1.19	100.00	No	Yes	No
	18.87	19.5	18.7	0.43	2.47	2410	2144	1.0	16	2.8	1.00	16.37	2.8	FALSE	1.0	16.4	2.8	4.6	19	84		2448	2381	0.96	0.17	1.00	1.19	100.00	No	Yes	No
	19.03	19.4	21.0	0.44	2.20	2429	2153	1.0	18	2.7	1.00	18.35	2.7	FALSE	1.0	18.4	2.7	4.0	21	83		2467	2390	0.96	0.17	1.00	1.19	100.00	No	Yes	No
	19.19	19.2	23.1	0.38	1.73	2449	2163	1.0	20	2.6	1.00	20.19	2.6	FALSE	1.0	20.2	2.6	3.4	23	76		2487	2400	0.96	0.17	0.99	1.19	100.00	No	Yes	No
	19.36	19.0	24.2	0.43	1.88	2469	2172	1.0	21	2.6	1.00	21.17	2.6	FALSE	1.0	21.2	2.6	3.4	24	80		2507	2409	0.95	0.17	0.99	1.19	100.00	No	Yes	No
	19.52	18.9	21.6	0.43	2.09	2489	2181	1.0	19	2.7	1.00	18.68	2.7	FALSE	1.0	18.7	2.7	3.9	21	81		2527	2419	0.95	0.17	0.99	1.19	100.00	No	Yes	No
	19.69	18.7	20.7	0.30	1.52	2508	2191	1.0	18	2.6	1.00	17.78	2.6	FALSE	1.0	17.8	2.6	3.5	20	70		2546	2428	0.95	0.17	0.99	1.19	100.00	No	Yes	No

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{vd} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
	19.85	18.6	21.5	0.33	1.60	2528	2200	1.0	18	2.6	1.00	18.43	2.6	FALSE	1.0	18.4	2.6	3.5	21	72		2566	2437	0.95	0.17	0.99	1.19	100.00	No	Yes	No
	20.01	18.4	21.8	0.41	2.00	2548	2210	1.0	19	2.7	1.00	18.61	2.7	FALSE	1.0	18.6	2.7	3.8	21	80		2586	2447	0.95	0.17	0.99	1.19	100.00	No	Yes	No
	20.18	18.2	21.2	0.40	1.99	2567	2219	1.0	18	2.7	1.00	17.94	2.7	FALSE	1.0	17.9	2.7	3.9	20	79		2605	2456	0.95	0.17	0.99	1.19	100.00	No	Yes	No
	20.34	18.1	22.8	0.41	1.91	2587	2229	0.9	19	2.7	1.00	19.32	2.7	FALSE	1.0	19.3	2.7	3.7	22	79		2625	2466	0.95	0.17	0.99	1.19	100.00	No	Yes	No
	20.51	17.9	23.1	0.40	1.82	2607	2238	0.9	19	2.6	1.00	19.44	2.6	FALSE	1.0	19.4	2.6	3.6	22	78		2645	2475	0.95	0.17	0.99	1.19	100.00	No	Yes	No
	20.67	17.7	23.9	0.48	2.10	2626	2248	0.9	20	2.7	1.00	20.12	2.7	FALSE	1.0	20.1	2.7	3.7	23	84		2664	2485	0.95	0.17	0.99	1.19	100.00	No	Yes	No
	20.83	17.6	20.1	0.44	2.31	2646	2257	0.9	17	2.8	1.00	16.67	2.8	FALSE	1.0	16.7	2.8	4.4	19	83		2684	2494	0.95	0.17	0.98	1.19	100.00	No	Yes	No
	21.00	17.4	17.5	0.41	2.50	2666	2266	0.9	14	2.8	1.00	14.29	2.8	FALSE	1.0	14.3	2.8	5.0	16	82		2704	2504	0.95	0.17	0.98	1.19	100.00	No	Yes	No
	21.16	17.2	20.6	0.41	2.15	2685	2276	0.9	17	2.7	1.00	16.89	2.7	FALSE	1.0	16.9	2.7	4.2	19	80		2723	2513	0.95	0.18	0.98	1.19	100.00	No	Yes	No
	21.33	17.1	20.3	0.36	1.89	2705	2285	0.9	17	2.7	1.00	16.58	2.7	FALSE	1.0	16.6	2.7	4.0	19	75		2743	2522	0.95	0.18	0.98	1.19	100.00	No	Yes	No
	21.49	16.9	25.2	0.40	1.68	2725	2295	1.0	21	2.6	0.50	21.59	2.6	FALSE	0.5	21.6	2.6	3.2	24	77	0.123	2763	2532	0.95	0.18	0.98	1.19	0.81	Yes	Yes	Yes
	21.65	16.7	28.6	0.45	1.64	2744	2304	1.0	24	2.5	0.50	24.71	2.5	FALSE	0.5	24.7	2.5	2.9	27	79	0.127	2782	2541	0.95	0.18	0.98	1.19	0.84	Yes	Yes	Yes
	21.82	16.6	27.4	0.43	1.66	2764	2314	1.0	22	2.6	0.50	23.52	2.5	FALSE	0.5	23.5	2.5	3.0	26	79	0.126	2802	2551	0.95	0.18	0.98	1.19	0.83	Yes	Yes	Yes
	21.98	16.4	17.5	0.34	2.13	2784	2323	0.9	14	2.8	1.00	13.87	2.8	FALSE	1.0	13.9	2.8	4.7	16	76		2822	2560	0.95	0.18	0.98	1.19	100.00	No	Yes	No
	22.15	16.3	12.1	0.24	2.22	2804	2333	0.9	9	3.0	1.00	9.17	3.0	FALSE	1.0	9.2	3.0	6.3	11	69		2842	2570	0.95	0.18	0.98	1.19	100.00	No	Yes	No
	22.31	16.1	10.4	0.21	2.27	2823	2342	0.9	8	3.0	1.00	7.71	3.0	FALSE	1.0	7.7	3.0	7.0	9	66		2861	2579	0.95	0.18	0.97	1.19	100.00	No	Yes	No
	22.47	15.9	18.0	0.32	1.90	2843	2352	0.9	14	2.8	1.00	14.11	2.8	FALSE	1.0	14.1	2.8	4.5	16	73		2881	2589	0.95	0.18	0.97	1.19	100.00	No	Yes	No
	22.64	15.8	18.7	0.35	2.04	2863	2361	0.9	15	2.8	1.00	14.60	2.8	FALSE	1.0	14.6	2.8	4.5	17	75		2901	2598	0.95	0.18	0.97	1.19	100.00	No	Yes	No
	22.80	15.6	12.0	0.29	2.74	2882	2370	0.9	9	3.0	1.00	8.95	3.0	FALSE	1.0	8.9	3.0	6.9	11	74		2920	2608	0.95	0.18	0.97	1.19	100.00	No	Yes	No
	22.97	15.4	10.6	0.17	1.81	2902	2380	0.9	8	3.0	1.00	7.65	3.0	FALSE	1.0	7.6	3.0	6.5	9	61		2940	2617	0.95	0.18	0.97	1.19	100.00	No	Yes	No
	23.13	15.3	9.8	0.16	1.90	2922	2389	0.9	7	3.0	1.00	6.98	3.0	FALSE	1.0	7.0	3.0	7.0	9	61		2960	2626	0.95	0.18	0.97	1.19	100.00	No	Yes	No
	23.29	15.1	10.6	0.24	2.68	2941	2399	0.9	8	3.1	1.00	7.60	3.1	FALSE	1.0	7.6	3.1	7.5	9	70		2979	2636	0.95	0.18	0.97	1.19	100.00	No	Yes	No
	23.46	14.9	14.4	0.31	2.41	2961	2408	0.9	11	2.9	1.00	10.73	2.9	FALSE	1.0	10.7	2.9	5.9	13	74		2999	2645	0.95	0.18	0.97	1.19	100.00	No	Yes	No
	23.62	14.8	15.1	0.32	2.33	2981	2418	0.9	11	2.9	1.00	11.27	2.9	FALSE	1.0	11.3	2.9	5.6	13	74		3019	2655	0.94	0.18	0.97	1.19	100.00	No	Yes	No
	23.79	14.6	34.8	0.34	1.02	3000	2427	0.9	27	2.4	0.50	29.35	2.3	FALSE	0.5	29.3	2.3	2.1	32	69	0.110	3038	2664	0.94	0.18	0.97	1.19	0.69	Yes	Yes	Yes
	23.95	14.5	37.3	0.40	1.11	3020	2437	0.9	29	2.4	0.50	31.48	2.3	FALSE	0.5	31.5	2.3	2.1	35	73	0.116	3058	2674	0.94	0.18	0.97	1.19	0.72	Yes	Yes	Yes
	24.11	14.3	33.1	0.46	1.47	3040	2446	0.9	26	2.5	0.50	27.79	2.5	FALSE	0.5	27.8	2.5	2.6	31	79	0.125	3078	2683	0.94	0.18	0.96	1.19	0.78	Yes	Yes	Yes
	24.28	14.1	23.9	0.58	2.59	3059	2455	0.9	18	2.7	1.00	18.22	2.7	FALSE	1.0	18.2	2.7	4.4	21	90		3097	2693	0.94	0.18	0.96	1.19	100.00	No	Yes	No
	24.44	14.0	17.7	0.43	2.68	3079	2465	0.9	13	2.9	1.00	13.13	2.9	FALSE	1.0	13.1	2.9	5.4	15	83		3117	2702	0.94	0.19	0.96	1.19	100.00	No	Yes	No
	24.61	13.8	14.1	0.39	3.15	3099	2474	0.9	10	3.0	1.00	10.11	3.0	FALSE	1.0	10.1	3.0	6.8	12	82		3137	2711	0.94	0.19	0.96	1.19	100.00	No	Yes	No
	24.77	13.6	19.7	0.41	2.27	3118	2484	0.9	15	2.8	1.00	14.60	2.8	FALSE	1.0	14.6	2.8	4.7	17	79		3156	2721	0.94	0.19	0.96	1.19	100.00	No	Yes	No
	24.93	13.5	13.7	0.45	3.67	3138	2493	0.8	10	3.1	1.00	9.75	3.1	FALSE	1.0	9.8	3.1	7.4	12	86		3176	2730	0.94	0.19	0.96	1.19	100.00	No	Yes	No
	25.10	13.3	12.0	0.34	3.28	3158	2503	0.8	8	3.1	1.00	8.30	3.1	FALSE	1.0	8.3	3.1	7.8	10	78		3196	2740	0.94	0.19	0.96	1.19	100.00	No	Yes	No
	25.26	13.1	9.9	0.24	2.85	3177	2512	0.8	7	3.1	1.00	6.62	3.1	FALSE	1.0	6.6	3.1	8.4	8	70		3215	2749	0.94	0.19	0.96	1.19	100.00	No	Yes	No
	25.43	13.0	8.9	0.18	2.41	3197	2522	0.8	6	3.1	1.00	5.79	3.1	FALSE	1.0	5.8	3.1	8.5	7	64		3235	2759	0.94	0.19	0.96	1.19	100.00	No	Yes	No
	25.59	12.8	9.1	0.18	2.35	3217	2531	0.8	6	3.1	1.00	5.89	3.1	FALSE	1.0	5.9	3.1	8.4	8	63		3255	2768	0.94	0.19	0.96	1.19	100.00	No	Yes	No
	25.76	12.6	9.3	0.21	2.69	3237	2541	0.8	6	3.2	1.00	6.05	3.2	FALSE	1.0	6.1	3.2	8.6	8	67		3275	2778	0.94	0.19	0.96	1.19	100.00	No	Yes	No
	25.92	12.5	9.6	0.25	3.13	3256	2550	0.8	6	3.2	1.00	6.23	3.2	FALSE	1.0	6.2	3.2	8.9	8	71		3294	2787	0.94	0.19	0.95	1.19	100.00	No	Yes	No
	26.08	12.3	10.3	0.33	3.78	3276	2559	0.8	7	3.2	1.00	6.73	3.2	FALSE	1.0	6.7	3.2	9.2	8	78		3314	2797	0.94	0.19	0.95	1.19	100.00	No	Yes	No
	26.25	12.2	13.2	0.41	3.56	3296	2569	0.8	9	3.1	1.00	9.00	3.1	FALSE	1.0	9.0	3.1	7.6	11	83		3334	2806	0.94	0.19	0.95	1.19	100.00	No	Yes	No
	26.41	12.0	16.5	0.43	2.89	3315	2578	0.8	11	2.9	1.00	11.49	2.9	FALSE	1.0	11.5	2.9	6.1	14	82		3353	2815	0.94	0.19	0.95	1.19	100.00	No	Yes	No
	26.58	11.8	15.4	0.44	3.19	3335	2588	0.8	11	3.0	1.00	10.60	3.0	FALSE	1.0	10.6	3.0	6.7	13	84		3373	2825	0.94	0.19	0.95	1.19	100.00	No	Yes	No
	26.74	11.7	15.2	0.42	3.11	3355	2597	0.8	10	3.0	1.00	10.43	3.0	FALSE	1.0	10.4	3.0	6.6	12	82		3393	2834	0.94	0.19	0.95	1.19	100.00	No	Yes	No
	26.90	11.5	14.1	0.46	3.70	3374	2607	0.8	10	3.1	1.00	9.51	3.1	FALSE	1.0	9.5	3.1	7.5	11	86		3412	2844	0.94	0.19	0.95	1.19	100.00	No	Yes	No
	27.07	11.3	15.0	0.45	3.35	3394	2616	0.8	10	3.0	1.00	10.15	3.0	FALSE	1.0	10.2	3.0	7.0	12	84		3432	2853	0.94	0.19	0.95	1.19	100.00	No	Yes	No
	27.23	11.2	19.4	0.47	2.67	3414	2626	0.8	13	2.9	1.00	13.48	2.9	FALSE	1.0	13.5	2.9	5.3	16	83		3452	2863	0.94	0.19	0.95	1.19	100.00	No	Yes	No
	27.40	11.0	21.2	0.50	2.56	3433	2635	0.8	15	2.8	1.00	14.82	2.8	FALSE	1.0	14.8	2.8	4.9	17	84		3471	2872	0.94	0.19	0.95	1.19	100.00	No	Yes	No
	27.56	10.8	17.3	0.45	2.86	3453	2644	0.8	12	2.9	1.00	11.81	2.9	FALSE	1.0	11.8	2.9	6.0	14	83		3491	2882	0.94	0.19	0.95	1.19	100.00	No	Yes	No
	27.72	10.7	11.4	0.41	4.19	3473	2654	0.8	7	3.2	1.00	7.32	3.2	FALSE	1.0	7.3	3.2	9.1	9	83		3511	2891	0.94	0.19	0.94	1.19	100.00	No	Yes	No
	27.89	10.5	13.6	0.35	2.96	3492	2663	0.8	9	3.0	1.00	8.90	3.0	FALSE	1.0	8.9	3.0	7.2	11	77		3530	2900	0.93	0.19	0.94	1.19	100.00	No	Yes	No
	28.05	10.3	10.6	0.29	3.30	3512	2673	0.8	7	3.2	1.00	6.64	3.2	FALSE	1.0	6.6	3.2	8.8	8	74		3550	2910	0.93	0.19	0.94	1.19	100.00	No	Yes	No
	28.22	10.2	8.4	0.27	4.08	3532	2682	0.8	5	3.3	1.00	4.95	3.3	FALSE	1.0	5.0	3.3	11.1	7	74		3570	2919	0.93	0.19	0.94	1.19	100.00	No	Yes	No
	28.38	10.0	10.5	0.34	3.85	3551	2692	0.8	6	3.2	1.00	6.46	3.2	FALSE	1.0	6.5	3.2	9.5	8	78		3589	2929	0.93	0.19	0.94	1.19	100.00	No	Yes	No
	28.54	9.9	11.4	0.44	4.53	3571	2701	0.8	7	3.2	1.00	7.12	3.2	FALSE	1.0	7.1	3.2	9.5	9	85		3609	2938	0.93	0.20	0.94	1.19	100.00	No	Yes	No
	28.71	9.7	15.2	0.39	2.90	3591	2711	0.8	10	3.0	1.00	9.93	3.0	FALSE	1.0	9.9	3.0	6.6	12	79		3629	2948	0.93	0.20	0.94	1.19	100.00	No	Yes	No
	28.87	9.5	13.9	0.31	2.52	3611	2720	0.8	9	3.0	1.00	8.91	3.0	FALSE	1.0	8.9	3.0	6.7	11	73		3649	2957	0.93	0.20	0.94	1.19	100.00	No	Yes	No
	29.04	9.4	10.7	0.24	2.73	3630	2729	0.8	7	3.1	1.00	6.52	3.1	FALSE	1.0	6.5	3.1	8.3	8	69		3668	2967	0.93	0.20	0.94	1.19	100.00	No	Yes	No
	29.20	9.2	9.0	0.30	4.19	3650	2739	0.8	5	3.3	1.00	5.26	3.3	FALSE	1.0	5.3	3.3	10.9	7	76		3688	2976	0.93	0.20	0.94	1.19	100.00	No	Yes	No
	29.36	9.0	11.1	0.47	5.12	3670	2748	0.8	7	3.3	1.00	6.74	3.3	FALSE	1.0	6.7	3.3	10.3	9	88		3708	2986	0.93	0.20	0.94	1.19	100.00	No	Yes	No
	29.53	8.9	26.6	0.45	1.80	3689	2758	0.8	18	2.7	1.00	17.96	2.7	FALSE	1.0	18.0	2.7	3.7	20	76		3727	2995	0.93	0.20	0.94	1.19	100.00	No	Yes	No
	29.69	8.7	44.4	0.02	0.05	3709	2767	0.9	31	2.0	0.50	35.20	1.9	FALSE	0.5	35.2	1.9	1.2	39	48	0.090	3747	3004	0.93	0.20	0.94	1.19	0.51	Yes	Yes	Yes
	29.86	8.5	49.0	0.16	0.33	3729	2777	0.9	34	2.1	0.50	38.87	2.0	FALSE	0.5	38.9	2.0	1.3	43	57	0.097	3767	3014	0.93	0.20	0.93	1.19	0.55	Yes	Yes	Yes
	30.02	8.4	24.2	0.14	0.61	3748	2786	0.9	16	2.5	0.50	18.41	2.4	FALSE	0.5	18.4	2.4	2.4	21	51	0.092	3786	3023	0.93	0.20	0.93	1.19	0.52	Yes	Yes	Yes
	30.18	8.2	40.8	0.16	0.42	3768	2796	0.9	28	2.2	0.50	32.00	2.1	FALSE	0.5	32.0	2.1	1.5	35	54	0.095	3806	3033	0.93	0.20	0.93	1.19	0.53	Yes	Yes	Yes
	30.35	8.1	42.1	0.18	0.46	3788	2805	0.9	29	2.2	0.50	32.97	2.1	FALSE	0.5	33.0	2.1	1.5	37	56	0.096	3826	3042	0.93	0.20	0.93	1.19	0.54	Yes	Yes	Yes
	30.51	7.9	42.9	0.20	0.48	3807	2815	0.9	29	2.2	0.50	33.64	2.1	FALSE	0.5	33.6	2.1	1.5	37	57	0.097	3845	3052	0.93	0.20	0.93	1.19	0.54	Yes	Yes	Yes
	30.68	7.7	43.8	0.19	0.46	3827	2824	0.9	30	2.2	0.50	34.31	2.1	FALSE	0.5	34.3	2.1	1.5	38	57	0.097	3865	3061	0.92	0.20	0.93	1.19	0.54	Yes	Yes	Yes
	30.84	7.6	42.8	0.17	0.42	3847	2833	0.9	29	2.2	0.50	33.40	2.1	FALSE	0.5	33.4	2.1	1.5	37	55	0.096	3885	3071	0.92	0.20	0.93	1.19	0.53	Yes	Yes	Yes
	31.00	7.4	41.2	0.19	0.47	3866	2843	0.9	28	2.2	0.50	32.05	2.2	FALSE	0.5	32.1	2.2	1.6	36	56	0.096	3904	3080	0.92	0.20	0.93	1.19	0.54	Yes	Yes	Yes
	31.17	7.2	40.2	0.19	0.48	3886	2852	0.9	27	2.2	0.50	31.13	2.2	FALSE	0.5	31.1	2.2	1.6	35	56	0.096	3924	3089	0.92	0.20	0.93	1.19	0.53	Yes	Yes	Yes
	31.33	7.1	39.0	0.18	0.49	3906	2862	0.9	26	2.2	0.50	30.10	2.2	FALSE	0.5	30.1	2.2	1.6	34	55	0.096	3944	3099	0.92	0.20	0.93	1.19	0.53	Yes	Yes	Yes
	31.50	6.9	38.0	0.16	0.43	3926	2871	0.9	25	2.2	0.50	29.27	2.2	FALSE	0.5	29.3	2.2	1.6	33	53	0.094	3964	3108	0.92	0.20	0.93	1.19	0.52	Yes	Yes	Yes
	31.66	6.7	39.1	0.18	0.48	3945	2881	0.9	26	2.2	0.50	30.09	2.2	FALSE	0.5	30.1	2.2	1.6	34	55	0.095	3983	3118	0.92	0.20	0.93	1.19	0.53	Yes	Yes	Yes
	31.82	6.6	40.5	0.19	0.49	3965	2890	0.9	27	2.2	0.50	31.13	2.2	FALSE	0.5	31.1	2.2	1.6	35	56	0.096	4003	3127	0.92	0.20	0.93	1.19	0.53	Yes	Yes	Yes
	31.99	6.4	44.6	0.15	0.36	3985	2900	0.9	29	2.1	0.50	34.40	2.1	FALSE	0.5	34.4	2.1	1.4	38	54	0.095	4023	3137	0.91	0.20	0.92	1.19	0.52	Yes	Yes	Yes
	32.15	6.2	45.1	0.15	0.35	4004	2909	0.9	30	2.1	0.50	34.71	2.1	FALSE	0.5	34.7	2.1	1.4	38	54	0.095	4042	3146	0.91	0.20	0.92	1.19	0.52	Yes	Yes	Yes
	32.32	6.1	37.6	0.20	0.56	4024	2918	0.9	24	2.3	0.50	28.67	2.2	FALSE	0.5	28.7	2.2	1.8	32	56	0.096	4062	3156	0.91	0.20	0.92	1.19	0.53	Yes	Yes	Yes
	32.48	5.9	27.5	0.32	1.25	4044	2928	0.9	17	2.6	0.50	20.46	2.5	FALSE	0.5	20.5	2.5	2.9	23	68	0.109	4082	3165	0.91	0.20	0.92	1.19	0.60	Yes	Yes	Yes
	32.64	5.8	18.2	0.31	1.91	4063	2937	0.7	11	2.9	1.00	11.03	2.9	FALSE	1.0	11.0	2.9	5.3	13	69		4101	3174	0.91	0.20	0.92	1.19	100.00	No	Yes	No
	32.81	5.6	11.7	0.21	2.16	4083	2947	0.7	7	3.1	1.00	6.59	3.1	FALSE	1.0	6.6	3.1	7.6	8	64		4121	3184	0.91	0.20	0.92	1.19	100.00	No	Yes	No
	32.97	5.4	8.5	0.13	1.96	4103	2956	0.7	4	3.2	1.00	4.38	3.2	FALSE	1.0	4.4	3.2	9.4	6	57		4141	3193	0.91	0.20	0.92	1.19	100.00	No	Yes	No
	33.14	5.3	7.3	0.10	1.87	4122	2966	0.7	4	3.3	1.00	3.53	3.3	FALSE	1.0	3.5	3.3	10.4	5	54		4160	3203	0.90	0.20	0.92	1.19	100.00	No	Yes	No
	33.30	5.1	7.9	0.14	2.43	4142	2975	0.7	4	3.3	1.00	3.95	3.3	FALSE	1.0	4.0	3.3	10.6	6	60		4180	3212	0.90	0.20	0.92	1.19	100.00	No	Yes	No
	33.47	4.9	10.9	0.20	2.30	4162	2985	0.7	6	3.1	1.00	5.91	3.1	FALSE	1.0	5.9	3.1	8.3	8	64		4200	3222	0.90	0.20	0.92	1.19	100.00	No	Yes	No
	33.63	4.8	11.4	0.24	2.55	4181	2994	0.7	6	3.1	1.00	6.25	3.1	FALSE	1.0	6.3	3.1	8.3	8	67		4219	3231	0.90	0.20	0.92	1.19	100.00	No	Yes	No
	33.79	4.6	24.1	0.38	1.73	4201	3004	0.7	15	2.7	1.00	14.66	2.7	FALSE	1.0	14.7	2.7	4.2	17	71		4239	3241	0.90	0.20	0.92	1.19	100.00	No	Yes	No
	33.96	4.4	29.5	0.48	1.75	4221	3013	0.7	18	2.6	1.00	18.21	2.6	FALSE	1.0	18.2	2.6	3.6	21	76		4259	3250	0.90	0.20	0.92	1.19	100.00	No	Yes	No
	34.12	4.3	29.9	0.49	1.77	4241	3022	0.7	18	2.6	1.00	18.38	2.6	FALSE	1.0	18.4	2.6	3.6	21	76		4279	3260	0.90	0.20	0.91	1.19	100.00	No	Yes	No
	34.29	4.1	26.8	0.51	2.06	4260	3032	0.7	16	2.7	1.00	16.24	2.7	FALSE	1.0	16.2	2.7	4.2	19	79		4298	3269	0.89	0.20	0.91	1.19	100.00	No	Yes	No
	34.45	4.0	30.0	0.53	1.92	4280	3041	0.7	18	2.7	1.00	18.29	2.7	FALSE	1.0	18.3	2.7	3.8	21	79		4318	3278	0.89	0.20	0.91	1.19	100.00	No	Yes	No
	34.61	3.8	43.1	0.19	0.47	4300	3051	0.8	27	2.2	0.50	32.20	2.2	FALSE	0.5	32.2	2.2	1.6	36	56	0.097	4338	3288	0.89	0.20	0.91	1.19	0.52	Yes	Yes	Yes
	34.78	3.6	50.7	0.15	0.31	4319	3060	0.8	32	2.1	0.50	38.16	2.0	FALSE	0.5	38.2	2.0	1.3	42	56	0.096	4357	3297	0.89	0.20	0.91	1.19	0.52	Yes	Yes	Yes

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
	34.94	3.5	49.1	0.15	0.33	4339	3070	0.8	31	2.1	0.50	36.85	2.0	FALSE	0.5	36.9	2.0	1.4	41	55	0.096	4377	3307	0.89	0.20	0.91	1.19	0.52	Yes	Yes	Yes
	35.11	3.3	48.3	0.15	0.33	4359	3079	0.8	30	2.1	0.50	36.15	2.1	FALSE	0.5	36.2	2.1	1.4	40	55	0.095	4397	3316	0.89	0.20	0.91	1.19	0.52	Yes	Yes	Yes
	35.27	3.1	44.8	0.19	0.45	4378	3089	0.8	28	2.2	0.50	33.35	2.1	FALSE	0.5	33.4	2.1	1.5	37	56	0.097	4416	3326	0.89	0.20	0.91	1.19	0.52	Yes	Yes	Yes
	35.43	3.0	41.6	0.20	0.52	4398	3098	0.8	25	2.3	0.50	30.79	2.2	FALSE	0.5	30.8	2.2	1.6	34	57	0.097	4436	3335	0.89	0.20	0.91	1.19	0.52	Yes	Yes	Yes
	35.60	2.8	40.9	0.23	0.60	4418	3107	0.8	25	2.3	0.50	30.17	2.2	FALSE	0.5	30.2	2.2	1.7	34	59	0.099	4456	3345	0.88	0.20	0.91	1.19	0.53	Yes	Yes	Yes
	35.76	2.6	41.4	0.34	0.86	4437	3117	0.8	25	2.4	0.50	30.49	2.3	FALSE	0.5	30.5	2.3	1.9	34	66	0.107	4475	3354	0.88	0.20	0.91	1.19	0.58	Yes	Yes	Yes
	35.93	2.5	34.3	0.77	2.39	4457	3126	0.7	21	2.7	1.00	20.51	2.7	FALSE	1.0	20.5	2.7	3.9	23	90		4495	3363	0.88	0.20	0.91	1.19	100.00	No	Yes	No
	36.09	2.3	22.7	0.72	3.54	4477	3136	0.7	13	2.9	1.00	13.06	2.9	FALSE	1.0	13.1	2.9	6.1	15	94		4515	3373	0.88	0.20	0.91	1.19	100.00	No	Yes	No
	36.25	2.1	14.0	0.58	4.98	4496	3145	0.7	7	3.2	1.00	7.46	3.2	FALSE	1.0	7.5	3.2	9.7	9	91		4534	3382	0.88	0.20	0.91	1.19	100.00	No	Yes	No
	36.42	2.0	9.3	0.36	5.09	4516	3155	0.7	4	3.4	1.00	4.43	3.4	FALSE	1.0	4.4	3.4	12.6	6	78		4554	3392	0.88	0.20	0.90	1.19	100.00	No	Yes	No
	36.58	1.8	9.0	0.22	3.22	4536	3164	0.7	4	3.3	1.00	4.26	3.3	FALSE	1.0	4.3	3.3	11.1	6	67		4574	3401	0.88	0.20	0.90	1.19	100.00	No	Yes	No
	36.75	1.7	10.1	0.16	2.09	4555	3174	0.7	5	3.2	1.00	4.92	3.2	FALSE	1.0	4.9	3.2	8.9	7	60		4593	3411	0.87	0.20	0.90	1.19	100.00	No	Yes	No
	36.91	1.5	9.5	0.17	2.34	4575	3183	0.7	5	3.2	1.00	4.53	3.2	FALSE	1.0	4.5	3.2	9.7	6	61		4613	3420	0.87	0.20	0.90	1.19	100.00	No	Yes	No
	37.07	1.3	8.2	0.20	3.32	4595	3192	0.7	4	3.4	1.00	3.69	3.4	FALSE	1.0	3.7	3.4	12.1	5	66		4633	3430	0.87	0.20	0.90	1.19	100.00	No	Yes	No
	37.24	1.2	8.1	0.15	2.52	4615	3202	0.7	4	3.3	1.00	3.64	3.3	FALSE	1.0	3.6	3.3	11.2	5	60		4653	3439	0.87	0.20	0.90	1.19	100.00	No	Yes	No
	37.40	1.0	7.9	0.15	2.73	4634	3211	0.7	3	3.4	1.00	3.49	3.4	FALSE	1.0	3.5	3.4	11.7	5	61		4672	3449	0.87	0.20	0.90	1.19	100.00	No	Yes	No
	37.57	0.8	7.7	0.16	3.06	4654	3221	0.7	3	3.4	1.00	3.32	3.4	FALSE	1.0	3.3	3.4	12.4	5	63		4692	3458	0.87	0.20	0.90	1.19	100.00	No	Yes	No
	37.73	0.7	7.7	0.14	2.65	4674	3230	0.7	3	3.4	1.00	3.34	3.4	FALSE	1.0	3.3	3.4	11.9	5	60		4712	3467	0.87	0.20	0.90	1.19	100.00	No	Yes	No
	37.89	0.5	8.0	0.02	0.35	4693	3240	0.7	4	3.0	1.00	3.51	3.0	FALSE	1.0	3.5	3.0	7.0	5	37		4731	3477	0.87	0.20	0.90	1.19	100.00	No	Yes	No
	38.06	0.3	8.8	0.02	0.31	4713	3249	0.7	4	3.0	1.00	3.98	3.0	FALSE	1.0	4.0	3.0	6.3	6	36		4751	3486	0.86	0.20	0.90	1.19	100.00	No	Yes	No
	38.22	0.2	10.6	0.02	0.24	4733	3259	0.6	5	2.8	1.00	5.04	2.8	FALSE	1.0	5.0	2.8	5.1	7	35		4771	3496	0.86	0.20	0.90	1.19	100.00	No	Yes	No
	38.39	0.0	17.4	0.02	0.13	4752	3268	0.8	9	2.5	0.50	11.40	2.4	FALSE	0.5	11.4	2.4	2.5	14	35	0.079	4790	3505	0.86	0.20	0.90	1.19	0.42	Yes	Yes	Yes
	38.55	-0.1	24.2	0.15	0.67	4772	3278	0.8	13	2.6	0.50	16.55	2.5	FALSE	0.5	16.5	2.5	2.7	19	52	0.093	4810	3515	0.86	0.20	0.90	1.19	0.50	Yes	Yes	Yes
	38.71	-0.3	35.9	0.16	0.47	4792	3287	0.8	20	2.3	0.50	25.38	2.2	FALSE	0.5	25.4	2.2	1.8	29	52	0.093	4830	3524	0.86	0.20	0.90	1.19	0.49	Yes	Yes	Yes
	38.88	-0.5	47.0	0.16	0.37	4811	3296	0.8	27	2.2	0.50	33.76	2.1	FALSE	0.5	33.8	2.1	1.4	38	54	0.095	4849	3534	0.86	0.20	0.90	1.19	0.51	Yes	Yes	Yes
	39.04	-0.6	50.5	0.16	0.34	4831	3306	0.8	29	2.1	0.50	36.35	2.1	FALSE	0.5	36.4	2.1	1.4	40	55	0.096	4869	3543	0.86	0.20	0.89	1.19	0.51	Yes	Yes	Yes
	39.21	-0.8	47.5	0.02	0.04	4851	3315	0.8	27	2.0	0.50	34.02	2.0	FALSE	0.5	34.0	2.0	1.2	38	47	0.089	4889	3552	0.85	0.20	0.89	1.19	0.47	Yes	Yes	Yes
	39.37	-1.0	47.5	0.02	0.04	4870	3325	0.8	27	2.0	0.50	34.00	2.0	FALSE	0.5	34.0	2.0	1.2	38	47	0.089	4908	3562	0.85	0.20	0.89	1.19	0.47	Yes	Yes	Yes
	39.53	-1.1	47.4	0.06	0.13	4890	3334	0.8	27	2.1	0.50	33.85	2.0	FALSE	0.5	33.8	2.0	1.3	38	48	0.090	4928	3571	0.85	0.20	0.89	1.19	0.48	Yes	Yes	Yes
	39.70	-1.3	45.8	0.09	0.21	4910	3344	0.8	26	2.1	0.50	32.59	2.0	FALSE	0.5	32.6	2.0	1.3	36	49	0.091	4948	3581	0.85	0.20	0.89	1.19	0.48	Yes	Yes	Yes
	39.86	-1.5	46.2	0.12	0.27	4929	3353	0.8	26	2.2	0.50	32.84	2.1	FALSE	0.5	32.8	2.1	1.4	37	51	0.092	4967	3590	0.85	0.20	0.89	1.19	0.49	Yes	Yes	Yes
	40.03	-1.6	47.5	0.16	0.35	4949	3363	0.8	27	2.2	0.50	33.72	2.1	FALSE	0.5	33.7	2.1	1.4	38	54	0.095	4987	3600	0.85	0.20	0.89	1.19	0.50	Yes	Yes	Yes
	40.19	-1.8	45.7	0.16	0.37	4969	3372	0.8	26	2.2	0.50	32.37	2.1	FALSE	0.5	32.4	2.1	1.5	36	54	0.094	5007	3609	0.85	0.20	0.89	1.19	0.50	Yes	Yes	Yes
	40.35	-2.0	42.7	0.16	0.39	4988	3381	0.8	24	2.2	0.50	30.06	2.1	FALSE	0.5	30.1	2.1	1.6	34	52	0.093	5026	3619	0.85	0.20	0.89	1.19	0.50	Yes	Yes	Yes
	40.52	-2.1	39.6	0.16	0.44	5008	3391	0.8	22	2.3	0.50	27.71	2.2	FALSE	0.5	27.7	2.2	1.7	31	52	0.093	5046	3628	0.84	0.20	0.89	1.19	0.50	Yes	Yes	Yes
	40.68	-2.3	37.2	0.20	0.59	5028	3400	0.8	20	2.4	0.50	25.84	2.3	FALSE	0.5	25.8	2.3	1.9	29	56	0.096	5066	3637	0.84	0.20	0.89	1.19	0.51	Yes	Yes	Yes
	40.85	-2.4	35.5	0.21	0.65	5048	3410	0.8	19	2.4	0.50	24.54	2.3	FALSE	0.5	24.5	2.3	2.0	28	57	0.097	5086	3647	0.84	0.20	0.89	1.19	0.51	Yes	Yes	Yes
	41.01	-2.6	37.1	0.25	0.71	5067	3419	0.8	20	2.4	0.50	25.67	2.3	FALSE	0.5	25.7	2.3	2.0	29	59	0.099	5105	3656	0.84	0.20	0.89	1.19	0.52	Yes	Yes	Yes
	41.18	-2.8	38.7	0.19	0.53	5087	3429	0.8	21	2.3	0.50	26.82	2.2	FALSE	0.5	26.8	2.2	1.8	30	55	0.095	5125	3666	0.84	0.20	0.89	1.19	0.50	Yes	Yes	Yes
	41.34	-2.9	40.1	0.05	0.13	5107	3438	0.8	22	2.2	0.50	27.84	2.1	FALSE	0.5	27.8	2.1	1.4	31	43	0.086	5145	3675	0.84	0.20	0.89	1.19	0.45	Yes	Yes	Yes
	41.50	-3.1	40.4	0.05	0.12	5126	3448	0.8	22	2.1	0.50	28.04	2.0	FALSE	0.5	28.0	2.0	1.4	32	43	0.086	5164	3685	0.84	0.20	0.89	1.19	0.45	Yes	Yes	Yes
	41.67	-3.3	38.8	0.13	0.36	5146	3457	0.8	21	2.3	0.50	26.81	2.2	FALSE	0.5	26.8	2.2	1.6	30	49	0.091	5184	3694	0.83	0.20	0.88	1.19	0.48	Yes	Yes	Yes
	41.83	-3.4	42.8	0.18	0.43	5166	3467	0.8	23	2.3	0.50	29.73	2.2	FALSE	0.5	29.7	2.2	1.6	33	54	0.094	5204	3704	0.83	0.20	0.88	1.19	0.50	Yes	Yes	Yes
	42.00	-3.6	47.8	0.14	0.32	5185	3476	0.8	26	2.2	0.50	33.34	2.1	FALSE	0.5	33.3	2.1	1.4	37	53	0.094	5223	3713	0.83	0.20	0.88	1.19	0.49	Yes	Yes	Yes
	42.16	-3.8	49.5	0.06	0.12	5205	3485	0.8	27	2.1	0.50	34.53	2.0	FALSE	0.5	34.5	2.0	1.2	39	48	0.090	5243	3723	0.83	0.20	0.88	1.19	0.48	Yes	Yes	Yes
	42.32	-3.9	48.1	0.04	0.09	5225	3495	0.8	26	2.1	0.50	33.44	2.0	FALSE	0.5	33.4	2.0	1.2	37	47	0.089	5263	3732	0.83	0.20	0.88	1.19	0.47	Yes	Yes	Yes
	42.49	-4.1	47.1	0.05	0.12	5244	3504	0.8	25	2.1	0.50	32.65	2.0	FALSE	0.5	32.6	2.0	1.3	37	47	0.089	5282	3741	0.83	0.20	0.88	1.19	0.47	Yes	Yes	Yes
	42.65	-4.3	46.9	0.06	0.14	5264	3514	0.8	25	2.1	0.50	32.46	2.0	FALSE	0.5	32.5	2.0	1.3	36	47	0.089	5302	3751	0.83	0.20	0.88	1.19	0.47	Yes	Yes	Yes
	42.82	-4.4	47.8	0.06	0.13	5284	3523	0.8	26	2.1	0.50	33.10	2.0	FALSE	0.5	33.1	2.0	1.3	37	47	0.089	5322	3760	0.83	0.20	0.88	1.19	0.47	Yes	Yes	Yes
	42.98	-4.6	47.0	0.05	0.12	5303	3533	0.8	25	2.1	0.50	32.41	2.0	FALSE	0.5	32.4	2.0	1.3	36	46	0.089	5341	3770	0.82	0.20	0.88	1.19	0.47	Yes	Yes	Yes
	43.14	-4.7	44.5	0.05	0.12	5323	3542	0.8	24	2.1	0.50	30.54	2.0	FALSE	0.5	30.5	2.0	1.3	34	45	0.087	5361	3779	0.82	0.20	0.88	1.19	0.46	Yes	Yes	Yes
	43.31	-4.9	44.4	0.10	0.23	5343	3552	0.8	24	2.2	0.50	30.45	2.1	FALSE	0.5	30.5	2.1	1.4	34	48	0.090	5381	3789	0.82	0.20	0.88	1.19	0.48	Yes	Yes	Yes
	43.47	-5.1	43.4	0.21	0.52	5363	3561	0.8	23	2.3	0.50	29.65	2.2	FALSE	0.5	29.7	2.2	1.7	33	56	0.096	5401	3798	0.82	0.20	0.88	1.19	0.51	Yes	Yes	Yes
	43.64	-5.2	34.1	0.51	1.63	5382	3570	0.6	18	2.6	1.00	17.58	2.6	FALSE	1.0	17.6	2.6	3.6	20	73		5420	3808	0.82	0.20	0.88	1.19	100.00	No	Yes	No
	43.80	-5.4	24.7	0.49	2.20	5402	3580	0.6	12	2.8	1.00	12.31	2.8	FALSE	1.0	12.3	2.8	5.2	15	76		5440	3817	0.82	0.20	0.88	1.19	100.00	No	Yes	No
	43.96	-5.6	36.9	0.31	0.90	5422	3589	0.8	19	2.5	0.50	24.81	2.4	FALSE	0.5	24.8	2.4	2.2	28	64	0.104	5460	3826	0.82	0.20	0.88	1.19	0.55	Yes	Yes	Yes
	44.13	-5.7	54.8	0.23	0.45	5441	3599	0.8	29	2.2	0.50	37.75	2.1	FALSE	0.5	37.7	2.1	1.4	42	60	0.100	5479	3836	0.81	0.20	0.88	1.19	0.53	Yes	Yes	Yes
	44.29	-5.9	59.4	0.12	0.22	5461	3608	0.8	31	2.0	0.50	41.03	1.9	FALSE	0.5	41.0	1.9	1.2	45	56	0.096	5499	3845	0.81	0.20	0.88	1.19	0.51	Yes	Yes	Yes
	44.46	-6.1	65.3	0.09	0.14	5481	3618	0.8	35	2.0	0.50	45.22	1.9	FALSE	0.5	45.2	1.9	1.1	50	57	0.097	5519	3855	0.81	0.20	0.87	1.19	0.51	Yes	Yes	Yes
	44.62	-6.2	69.2	0.02	0.03	5500	3627	0.8	37	1.9	0.50	48.00	1.8	FALSE	0.5	48.0	1.8	1.1	53	59	0.099	5538	3864	0.81	0.20	0.87	1.19	0.52	Yes	Yes	Yes
	44.78	-6.4	71.0	0.05	0.07	5520	3637	0.8	38	1.9	0.50	49.22	1.8	FALSE	0.5	49.2	1.8	1.1	54	60	0.100	5558	3874	0.81	0.20	0.87	1.19	0.53	Yes	Yes	Yes
	44.95	-6.5	40.2	0.04	0.10	5540	3646	0.8	21	2.2	0.50	26.94	2.1	FALSE	0.5	26.9	2.1	1.4	31	42	0.085	5578	3883	0.81	0.20	0.87	1.19	0.45	Yes	Yes	Yes
	45.11	-6.7	68.9	0.04	0.05	5559	3655	0.8	36	1.9	0.50	47.58	1.8	FALSE	0.5	47.6	1.8	1.1	52	58	0.098	5597	3893	0.81	0.20	0.87	1.19	0.52	Yes	Yes	Yes
	45.28	-6.9	76.1	0.02	0.03	5579	3665	0.8	40	1.9	0.50	52.63	1.8	FALSE	0.5	52.6	1.8	1.1	58	62	0.103	5617	3902	0.81	0.20	0.87	1.19	0.54	Yes	Yes	Yes
	45.44	-7.0	67.6	0.02	0.03	5599	3674	0.8	35	1.9	0.50	46.47	1.8	FALSE	0.5	46.5	1.8	1.1	51	57	0.098	5637	3912	0.80	0.20	0.87	1.19	0.51	Yes	Yes	Yes
	45.60	-7.2	59.4	0.02	0.04	5618	3684	0.8	31	2.0	0.50	40.53	1.9	FALSE	0.5	40.5	1.9	1.2	45	52	0.093	5656	3921	0.80	0.20	0.87	1.19	0.49	Yes	Yes	Yes
	45.77	-7.4	53.1	0.02	0.04	5638	3693	0.8	27	2.0	0.50	35.95	1.9	FALSE	0.5	35.9	1.9	1.2	40	49	0.091	5676	3930	0.80	0.20	0.87	1.19	0.48	Yes	Yes	Yes
	45.93	-7.5	51.8	0.02	0.04	5658	3703	0.8	26	2.1	0.50	35.00	1.9	FALSE	0.5	35.0	1.9	1.2	39	48	0.090	5696	3940	0.80	0.20	0.87	1.19	0.47	Yes	Yes	Yes
	46.10	-7.7	57.5	0.02	0.04	5678	3712	0.8	29	2.0	0.50	39.02	1.9	FALSE	0.5	39.0	1.9	1.2	43	51	0.093	5716	3949	0.80	0.20	0.87	1.19	0.49	Yes	Yes	Yes
	46.26	-7.9	63.6	0.02	0.03	5697	3722	0.8	33	2.0	0.50	43.31	1.8	FALSE	0.5	43.3	1.8	1.1	48	55	0.095	5735	3959	0.80	0.20	0.87	1.19	0.50	Yes	Yes	Yes
	46.42	-8.0	60.9	0.02	0.03	5717	3731	0.8	31	2.0	0.50	41.32	1.9	FALSE	0.5	41.3	1.9	1.2	46	53	0.094	5755	3968	0.80	0.20	0.87	1.19	0.49	Yes	Yes	Yes
	46.59	-8.2	61.0	0.02	0.03	5737	3741	0.8	31	2.0	0.50	41.30	1.9	FALSE	0.5	41.3	1.9	1.2	46	53	0.094	5775	3978	0.79	0.20	0.87	1.19	0.49	Yes	Yes	Yes
	46.75	-8.4	66.4	0.02	0.03	5756	3750	0.8	34	2.0	0.50	45.11	1.8	FALSE	0.5	45.1	1.8	1.1	50	56	0.097	5794	3987	0.79	0.20	0.87	1.19	0.51	Yes	Yes	Yes
	46.92	-8.5	72.3	0.02	0.03	5776	3759	0.8	37	1.9	0.50	49.20	1.8	FALSE	0.5	49.2	1.8	1.1	54	60	0.100	5814	3997	0.79	0.20	0.87	1.19	0.53	Yes	Yes	Yes
	47.08	-8.7	67.6	0.02	0.03	5796	3769	0.7	34	1.9	0.50	45.85	1.8	FALSE	0.5	45.8	1.8	1.1	51	57	0.097	5834	4006	0.79	0.20	0.87	1.19	0.51	Yes	Yes	Yes
	47.24	-8.8	66.7	0.02	0.03	5815	3778	0.7	34	2.0	0.50	45.11	1.8	FALSE	0.5	45.1	1.8	1.1	50	56	0.097	5853	4015	0.79	0.20	0.87	1.19	0.51	Yes	Yes	Yes
	47.41	-9.0	66.2	0.02	0.03	5835	3788	0.7	33	2.0	0.50	44.69	1.8	FALSE	0.5	44.7	1.8	1.1	49	56	0.096	5873	4025	0.79	0.20	0.86	1.19	0.51	Yes	Yes	Yes
	47.57	-9.2	61.8	0.08	0.13	5855	3797	0.7	31	2.0	0.50	41.52	1.9	FALSE	0.5	41.5	1.9	1.2	46	54	0.095	5893	4034	0.79	0.20	0.86	1.19	0.50	Yes	Yes	Yes
	47.74	-9.3	60.0	0.16	0.29	5874	3807	0.7	30	2.1	0.50	40.22	2.0	FALSE	0.5	40.2	2.0	1.3	45	57	0.098	5912	4044	0.79	0.20	0.86	1.19	0.51	Yes	Yes	Yes
	47.90	-9.5	81.1	0.27	0.35	5894	3816	0.7	41	2.0	0.50	55.02	1.9	FALSE	0.5	55.0	1.9	1.2	60	71	0.114	5932	4053	0.78	0.20	0.86	1.19	0.60	Yes	Yes	Yes
	48.06	-9.7	107.6	0.14	0.13	5914	3826	0.7	55	1.8	0.50	73.58	1.6	FALSE	0.5	73.6	1.6	1.0	80	80	0.128	5952	4063	0.78	0.20	0.86	1.19	0.67	Yes	Yes	Yes
	48.23	-9.8	123.1	0.05	0.04	5933	3835	0.7	63	1.7	0.50	84.32	1.6	FALSE	0.5	84.3	1.6	1.0	91	91	0.151	5971	4072	0.78	0.20	0.86	1.19	0.80	Yes	Yes	Yes
	48.39	-10.0	124.7	0.10	0.08	5953	3844	0.7	63	1.7	0.50	85.39	1.6	FALSE	0.5	85.4	1.6	1.0	93	93	0.154	5991	4082	0.78	0.20	0.86	1.19	0.81	Yes	Yes	Yes
	48.56	-10.2	121.4	0.14	0.12	5973	3854	0.7	61	1.7	0.50	82.94	1.6	FALSE	0.5	82.9	1.6	1.0	90	90	0.148	6011	4091	0.78	0.19	0.86	1.19	0.78	Yes	Yes	Yes
	48.72	-10.3	119.8	0.17	0.14	5992	3863	0.7	60	1.7	0.50	81.67	1.6	FALSE	0.5	81.7	1.6	1.0	89	89	0.145	6030	4100	0.78	0.19	0.86	1.19	0.76	Yes	Yes	Yes
	48.89	-10.5	118.6	0.18	0.15	6012	3873	0.7	60	1.7	0.50	80.73	1.6	FALSE	0.5	80.7	1.6	1.0	88	88	0.143	6050	4110	0.78	0.19	0.86	1.19	0.75	Yes	Yes	Yes
	49.05	-10.6	123.3	0.19	0.16	6032	3882	0.7	62	1.7	0.50	83.94	1.6	FALSE	0.5	83.9	1.6	1.0	91	91	0.150	6070	4119	0.77	0.19	0.86	1.19	0.79	Yes	Yes	Yes
	49.21	-10.8	122.6	0.21	0.17	6052	3892	0.7	61	1.7	0.50	83.32	1.6	FALSE	0.5	83.3	1.6	1.0	90	90	0.149	6090	4129	0.77	0.19	0.86	1.19	0.78	Yes	Yes	Yes
	49.38	-11.0	116.7	0.21	0.19	6071	3901	0.7	58	1.8	0.50	79.09	1.6	FALSE	0.5	79.1	1.6	1.0	86	86	0.139	6109	4138	0.77	0.19	0.86	1.19	0.73	Yes	Yes	Yes
	49.54	-11.1	112.7	0.19	0.17	6091	3911	0.7	56	1.8	0.50	76.24	1.6	FALSE	0.5	76.2	1.6	1.0	83	83	0.133	6129	4148	0.77	0.19	0.86	1.19	0.70	Yes	Yes	Yes
	49.71	-11.3	113.3	0.15	0.13	6111	3920	0.7	56	1.8	0.50	76.57	1.6	FALSE	0.5	76.6	1.6	1.0	83	83	0.134	6149	4157	0.77	0.19	0.86	1.19	0.71	Yes	Yes	Yes
	49.87	-11.5	109.6	0.15	0.14	6130	3929	0.7	54	1.8	0.50	73.86	1.6	FALSE	0.5	73.9	1.6	1.0	80	80	0.128	6168	4167	0.77	0.19	0.86	1.19	0.68	Yes	Yes	Yes

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude: Kσ	Corrections for confining stress & EQ magnitude: MSF	Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
	50.03	-11.6	110.6	0.16	0.15	6150	3939	0.7	55	1.8	0.50	74.46	1.6	FALSE	0.5	74.5	1.6	1.0	81	81	0.129	6188	4176	0.77	0.19	0.86	1.19	0.68	Yes	Yes	Yes
	50.20	-11.8	113.9	0.17	0.15	6170	3948	0.7	56	1.8	0.50	76.71	1.6	FALSE	0.5	76.7	1.6	1.0	83	83	0.134	6208	4186	0.77	0.19	0.86	1.19	0.71	Yes	Yes	Yes
	50.36	-12.0	111.8	0.17	0.16	6189	3958	0.7	55	1.8	0.50	75.13	1.6	FALSE	0.5	75.1	1.6	1.0	82	82	0.131	6227	4195	0.76	0.19	0.86	1.19	0.69	Yes	Yes	Yes
	50.53	-12.1	108.6	0.18	0.17	6209	3967	0.7	53	1.8	0.50	72.84	1.7	FALSE	0.5	72.8	1.7	1.0	79	81	0.129	6247	4204	0.76	0.19	0.85	1.19	0.68	Yes	Yes	Yes
	50.69	-12.3	105.3	0.17	0.17	6229	3977	0.7	51	1.8	0.50	70.49	1.7	FALSE	0.5	70.5	1.7	1.0	77	79	0.126	6267	4214	0.76	0.19	0.85	1.19	0.66	Yes	Yes	Yes
	50.85	-12.5	100.4	0.17	0.17	6248	3986	0.7	49	1.8	0.50	66.99	1.7	FALSE	0.5	67.0	1.7	1.0	73	76	0.121	6286	4223	0.76	0.19	0.85	1.19	0.64	Yes	Yes	Yes
	51.02	-12.6	95.3	0.17	0.18	6268	3996	0.7	46	1.9	0.50	63.42	1.7	FALSE	0.5	63.4	1.7	1.1	69	74	0.117	6306	4233	0.76	0.19	0.85	1.19	0.62	Yes	Yes	Yes
	51.18	-12.8	90.2	0.11	0.13	6288	4005	0.7	43	1.9	0.50	59.78	1.7	FALSE	0.5	59.8	1.7	1.1	66	69	0.111	6326	4242	0.76	0.19	0.85	1.19	0.59	Yes	Yes	Yes
	51.35	-12.9	87.0	0.09	0.11	6307	4015	0.7	42	1.9	0.50	57.52	1.7	FALSE	0.5	57.5	1.7	1.1	63	67	0.108	6345	4252	0.76	0.19	0.85	1.19	0.57	Yes	Yes	Yes
	51.51	-13.1	65.4	0.10	0.16	6327	4024	0.7	31	2.0	0.50	42.68	1.9	FALSE	0.5	42.7	1.9	1.2	47	56	0.096	6365	4261	0.75	0.19	0.85	1.19	0.51	Yes	Yes	Yes
	51.67	-13.3	57.7	0.07	0.12	6347	4033	0.7	27	2.1	0.50	37.31	1.9	FALSE	0.5	37.3	1.9	1.2	42	51	0.092	6385	4271	0.75	0.19	0.85	1.19	0.49	Yes	Yes	Yes
	51.84	-13.4	54.6	0.05	0.11	6366	4043	0.7	25	2.1	0.50	35.13	1.9	FALSE	0.5	35.1	1.9	1.2	39	48	0.090	6404	4280	0.75	0.19	0.85	1.19	0.48	Yes	Yes	Yes
	52.00	-13.6	48.5	0.05	0.11	6386	4052	0.7	22	2.1	0.50	30.91	2.0	FALSE	0.5	30.9	2.0	1.3	35	45	0.088	6424	4289	0.75	0.19	0.85	1.19	0.47	Yes	Yes	Yes
	52.17	-13.8	46.1	0.06	0.14	6406	4062	0.7	21	2.2	0.50	29.28	2.0	FALSE	0.5	29.3	2.0	1.3	33	45	0.087	6444	4299	0.75	0.19	0.85	1.19	0.46	Yes	Yes	Yes
	52.33	-13.9	49.3	0.06	0.13	6425	4071	0.7	23	2.1	0.50	31.42	2.0	FALSE	0.5	31.4	2.0	1.3	36	46	0.089	6463	4308	0.75	0.19	0.85	1.19	0.47	Yes	Yes	Yes
	52.49	-14.1	58.9	0.04	0.07	6445	4081	0.7	27	2.0	0.50	37.91	1.9	FALSE	0.5	37.9	1.9	1.2	42	51	0.092	6483	4318	0.75	0.19	0.85	1.19	0.49	Yes	Yes	Yes
	52.66	-14.3	61.4	0.03	0.05	6465	4090	0.7	28	2.0	0.50	39.56	1.9	FALSE	0.5	39.6	1.9	1.2	44	52	0.093	6503	4327	0.75	0.19	0.85	1.19	0.49	Yes	Yes	Yes
	52.82	-14.4	50.7	0.02	0.05	6485	4100	0.7	23	2.1	0.50	32.21	2.0	FALSE	0.5	32.2	2.0	1.3	36	46	0.088	6523	4337	0.74	0.19	0.85	1.19	0.47	Yes	Yes	Yes
	52.99	-14.6	42.8	0.02	0.05	6504	4109	0.7	19	2.2	0.50	26.83	2.1	FALSE	0.5	26.8	2.1	1.4	31	42	0.085	6542	4346	0.74	0.19	0.85	1.19	0.45	Yes	Yes	Yes
	53.15	-14.8	40.9	0.02	0.05	6524	4118	0.7	18	2.2	0.50	25.49	2.1	FALSE	0.5	25.5	2.1	1.4	29	41	0.084	6562	4356	0.74	0.19	0.85	1.19	0.45	Yes	Yes	Yes
	53.31	-14.9	42.9	0.02	0.05	6544	4128	0.7	19	2.2	0.50	26.81	2.1	FALSE	0.5	26.8	2.1	1.4	31	42	0.085	6582	4365	0.74	0.19	0.85	1.19	0.45	Yes	Yes	Yes
	53.48	-15.1	51.9	0.02	0.04	6563	4137	0.7	24	2.1	0.50	32.86	2.0	FALSE	0.5	32.9	2.0	1.3	37	47	0.089	6601	4374	0.74	0.19	0.85	1.19	0.47	Yes	Yes	Yes
	53.64	-15.2	57.4	0.02	0.04	6583	4147	0.7	26	2.1	0.50	36.50	1.9	FALSE	0.5	36.5	1.9	1.2	41	50	0.091	6621	4384	0.74	0.19	0.85	1.19	0.48	Yes	Yes	Yes
	53.81	-15.4	56.0	0.02	0.04	6603	4156	0.7	25	2.1	0.50	35.54	1.9	FALSE	0.5	35.5	1.9	1.2	40	49	0.091	6641	4393	0.74	0.19	0.84	1.19	0.48	Yes	Yes	Yes
	53.97	-15.6	55.5	0.02	0.04	6622	4166	0.7	25	2.1	0.50	35.13	1.9	FALSE	0.5	35.1	1.9	1.2	40	48	0.090	6660	4403	0.73	0.19	0.84	1.19	0.48	Yes	Yes	Yes
	54.13	-15.7	55.1	0.02	0.04	6642	4175	0.7	25	2.1	0.50	34.86	1.9	FALSE	0.5	34.9	1.9	1.2	39	48	0.090	6680	4412	0.73	0.19	0.84	1.19	0.48	Yes	Yes	Yes
	54.30	-15.9	55.3	0.04	0.07	6662	4185	0.7	25	2.1	0.50	34.92	1.9	FALSE	0.5	34.9	1.9	1.2	39	48	0.090	6700	4422	0.73	0.19	0.84	1.19	0.48	Yes	Yes	Yes
	54.46	-16.1	56.2	0.02	0.04	6681	4194	0.7	25	2.1	0.50	35.50	1.9	FALSE	0.5	35.5	1.9	1.2	40	49	0.091	6719	4431	0.73	0.19	0.84	1.19	0.48	Yes	Yes	Yes
	54.63	-16.2	34.6	0.02	0.06	6701	4203	0.7	15	2.3	0.50	20.93	2.2	FALSE	0.5	20.9	2.2	1.6	25	39	0.082	6739	4441	0.73	0.19	0.84	1.19	0.44	Yes	Yes	Yes
	54.79	-16.4	67.6	0.02	0.03	6721	4213	0.7	31	2.0	0.50	43.06	1.8	FALSE	0.5	43.1	1.8	1.1	48	55	0.095	6759	4450	0.73	0.19	0.84	1.19	0.51	Yes	Yes	Yes
	54.95	-16.6	77.6	0.02	0.03	6740	4222	0.7	35	1.9	0.50	49.64	1.8	FALSE	0.5	49.6	1.8	1.1	55	60	0.100	6778	4460	0.73	0.19	0.84	1.19	0.54	Yes	Yes	Yes
	55.12	-16.7	76.3	0.02	0.03	6760	4232	0.7	34	1.9	0.50	48.75	1.8	FALSE	0.5	48.7	1.8	1.1	54	60	0.100	6798	4469	0.73	0.19	0.84	1.19	0.53	Yes	Yes	Yes
	55.28	-16.9	62.9	0.02	0.03	6780	4241	0.7	28	2.0	0.50	39.74	1.9	FALSE	0.5	39.7	1.9	1.2	44	52	0.093	6818	4478	0.72	0.19	0.84	1.19	0.50	Yes	Yes	Yes
	55.45	-17.0	55.9	0.02	0.04	6800	4251	0.7	25	2.1	0.50	35.00	1.9	FALSE	0.5	35.0	1.9	1.2	39	48	0.090	6838	4488	0.72	0.19	0.84	1.19	0.48	Yes	Yes	Yes
	55.61	-17.2	54.0	0.02	0.04	6819	4260	0.7	24	2.1	0.50	33.73	2.0	FALSE	0.5	33.7	2.0	1.2	38	47	0.089	6857	4497	0.72	0.19	0.84	1.19	0.48	Yes	Yes	Yes
	55.77	-17.4	55.3	0.02	0.04	6839	4270	0.7	24	2.1	0.50	34.52	1.9	FALSE	0.5	34.5	1.9	1.2	39	48	0.090	6877	4507	0.72	0.19	0.84	1.19	0.48	Yes	Yes	Yes
	55.94	-17.5	57.3	0.02	0.04	6859	4279	0.7	25	2.1	0.50	35.82	1.9	FALSE	0.5	35.8	1.9	1.2	40	49	0.091	6897	4516	0.72	0.19	0.84	1.19	0.49	Yes	Yes	Yes
	56.10	-17.7	58.7	0.02	0.04	6878	4289	0.7	26	2.1	0.50	36.68	1.9	FALSE	0.5	36.7	1.9	1.2	41	50	0.091	6916	4526	0.72	0.19	0.84	1.19	0.49	Yes	Yes	Yes
	56.27	-17.9	66.3	0.08	0.13	6898	4298	0.7	29	2.0	0.50	41.70	1.9	FALSE	0.5	41.7	1.9	1.2	47	54	0.095	6936	4535	0.72	0.19	0.84	1.19	0.51	Yes	Yes	Yes
	56.43	-18.0	78.9	0.20	0.27	6918	4307	0.7	35	2.0	0.50	49.97	1.9	FALSE	0.5	50.0	1.9	1.2	55	65	0.106	6956	4545	0.71	0.19	0.84	1.19	0.57	Yes	Yes	Yes
	56.59	-18.2	81.3	0.36	0.46	6937	4317	0.7	36	2.1	0.50	51.51	2.0	FALSE	0.5	51.5	2.0	1.3	57	72	0.114	6975	4554	0.71	0.19	0.84	1.19	0.61	Yes	Yes	Yes
	56.76	-18.4	73.8	0.22	0.31	6957	4326	0.7	32	2.1	0.50	46.46	1.9	FALSE	0.5	46.5	1.9	1.2	52	63	0.104	6995	4563	0.71	0.19	0.84	1.19	0.56	Yes	Yes	Yes
	56.92	-18.5	74.4	0.08	0.11	6977	4336	0.7	33	2.0	0.50	46.85	1.8	FALSE	0.5	46.9	1.8	1.1	52	58	0.098	7015	4573	0.71	0.19	0.84	1.19	0.53	Yes	Yes	Yes
	57.09	-18.7	71.5	0.06	0.09	6996	4345	0.7	31	2.0	0.50	44.86	1.8	FALSE	0.5	44.9	1.8	1.1	50	56	0.097	7034	4582	0.71	0.19	0.84	1.19	0.52	Yes	Yes	Yes
	57.25	-18.9	67.7	0.07	0.11	7016	4355	0.7	29	2.0	0.50	42.27	1.9	FALSE	0.5	42.3	1.9	1.2	47	54	0.095	7054	4592	0.71	0.19	0.83	1.19	0.51	Yes	Yes	Yes
	57.42	-19.0	71.1	0.08	0.12	7036	4364	0.7	31	2.0	0.50	44.50	1.8	FALSE	0.5	44.5	1.8	1.1	50	57	0.097	7074	4601	0.71	0.19	0.83	1.19	0.52	Yes	Yes	Yes
	57.58	-19.2	81.3	0.04	0.05	7055	4374	0.7	36	1.9	0.50	51.10	1.8	FALSE	0.5	51.1	1.8	1.1	57	62	0.102	7093	4611	0.71	0.18	0.83	1.19	0.55	Yes	Yes	Yes
	57.74	-19.3	83.0	0.06	0.07	7075	4383	0.7	36	1.9	0.50	52.20	1.8	FALSE	0.5	52.2	1.8	1.1	58	62	0.103	7113	4620	0.70	0.18	0.83	1.19	0.55	Yes	Yes	Yes
	57.91	-19.5	75.0	0.03	0.04	7095	4392	0.7	33	2.0	0.50	46.88	1.8	FALSE	0.5	46.9	1.8	1.1	52	58	0.098	7133	4630	0.70	0.18	0.83	1.19	0.53	Yes	Yes	Yes
	58.07	-19.7	66.4	0.02	0.03	7115	4402	0.7	29	2.0	0.50	41.21	1.9	FALSE	0.5	41.2	1.9	1.2	46	53	0.094	7153	4639	0.70	0.18	0.83	1.19	0.51	Yes	Yes	Yes
	58.24	-19.8	62.5	0.03	0.04	7134	4411	0.7	27	2.1	0.50	38.57	1.9	FALSE	0.5	38.6	1.9	1.2	43	51	0.093	7172	4648	0.70	0.18	0.83	1.19	0.50	Yes	Yes	Yes
	58.40	-20.0	53.7	0.02	0.04	7154	4421	0.7	23	2.1	0.50	32.75	2.0	FALSE	0.5	32.8	2.0	1.3	37	47	0.089	7192	4658	0.70	0.18	0.83	1.19	0.48	Yes	Yes	Yes
	58.56	-20.2	53.2	0.02	0.04	7174	4430	0.7	22	2.1	0.50	32.39	2.0	FALSE	0.5	32.4	2.0	1.3	37	46	0.089	7212	4667	0.70	0.18	0.83	1.19	0.48	Yes	Yes	Yes
	58.73	-20.3	53.6	0.02	0.04	7193	4440	0.7	23	2.1	0.50	32.63	2.0	FALSE	0.5	32.6	2.0	1.3	37	47	0.089	7231	4677	0.70	0.18	0.83	1.19	0.48	Yes	Yes	Yes
	58.89	-20.5	49.5	0.04	0.09	7213	4449	0.7	21	2.2	0.50	29.94	2.0	FALSE	0.5	29.9	2.0	1.3	34	45	0.087	7251	4686	0.69	0.18	0.83	1.19	0.47	Yes	Yes	Yes
	59.06	-20.7	39.9	0.10	0.26	7233	4459	0.7	16	2.3	0.50	23.60	2.2	FALSE	0.5	23.6	2.2	1.7	27	45	0.088	7271	4696	0.69	0.18	0.83	1.19	0.48	Yes	Yes	Yes
	59.22	-20.8	34.8	0.28	0.90	7252	4468	0.5	14	2.6	1.00	13.95	2.6	FALSE	1.0	13.9	2.6	3.4	16	55		7290	4705	0.69	0.18	0.83	1.19	100.00	No	Yes	No
	59.38	-21.0	44.8	0.41	0.99	7272	4478	0.7	18	2.5	0.50	26.72	2.4	FALSE	0.5	26.7	2.4	2.2	31	68	0.110	7310	4715	0.69	0.18	0.83	1.19	0.60	Yes	Yes	Yes
	59.55	-21.1	60.6	0.33	0.58	7292	4487	0.7	25	2.3	0.50	36.97	2.1	FALSE	0.5	37.0	2.1	1.5	42	64	0.104	7330	4724	0.69	0.18	0.83	1.19	0.57	Yes	Yes	Yes
	59.71	-21.3	68.8	0.49	0.75	7311	4496	0.7	29	2.3	0.50	42.24	2.1	FALSE	0.5	42.2	2.1	1.5	47	73	0.116	7349	4734	0.69	0.18	0.83	1.19	0.63	Yes	Yes	Yes
	59.88	-21.5	75.6	0.43	0.60	7331	4506	0.7	32	2.2	0.50	46.62	2.1	FALSE	0.5	46.6	2.1	1.4	52	72	0.114	7369	4743	0.69	0.18	0.83	1.19	0.62	Yes	Yes	Yes
	60.04	-21.6	85.2	0.35	0.43	7351	4515	0.7	36	2.1	0.50	52.72	1.9	FALSE	0.5	52.7	1.9	1.2	58	72	0.115	7389	4752	0.69	0.18	0.83	1.19	0.62	Yes	Yes	Yes
	60.20	-21.8	92.2	0.12	0.14	7370	4525	0.7	39	1.9	0.50	57.21	1.8	FALSE	0.5	57.2	1.8	1.1	63	68	0.109	7408	4762	0.68	0.18	0.83	1.19	0.59	Yes	Yes	Yes
	60.37	-22.0	95.6	0.16	0.17	7390	4534	0.7	41	1.9	0.50	59.35	1.8	FALSE	0.5	59.3	1.8	1.1	65	70	0.112	7428	4771	0.68	0.18	0.83	1.19	0.61	Yes	Yes	Yes
	60.53	-22.1	97.2	0.21	0.23	7410	4544	0.7	41	1.9	0.50	60.33	1.8	FALSE	0.5	60.3	1.8	1.1	66	73	0.116	7448	4781	0.68	0.18	0.83	1.19	0.63	Yes	Yes	Yes
	60.70	-22.3	104.0	0.58	0.58	7430	4553	0.7	44	2.1	0.50	64.59	1.9	FALSE	0.5	64.6	1.9	1.2	71	86	0.140	7468	4790	0.68	0.18	0.83	1.19	0.76	Yes	Yes	Yes
	60.86	-22.5	119.2	0.85	0.73	7449	4563	0.7	51	2.1	0.50	74.34	1.9	FALSE	0.5	74.3	1.9	1.2	81	99	0.170	7487	4800	0.68	0.18	0.83	1.19	0.93	Yes	Yes	Yes
	61.02	-22.6	130.1	0.60	0.48	7469	4572	0.7	55	1.9	0.50	81.23	1.8	FALSE	0.5	81.2	1.8	1.1	88	98	0.167	7507	4809	0.68	0.18	0.82	1.19	0.91	Yes	Yes	Yes
	61.19	-22.8	134.2	0.45	0.35	7489	4581	0.7	57	1.9	0.50	83.81	1.7	FALSE	0.5	83.8	1.7	1.1	91	96	0.163	7527	4819	0.68	0.18	0.82	1.19	0.89	Yes	Yes	Yes
	61.35	-23.0	120.2	0.47	0.41	7508	4591	0.7	51	1.9	0.50	74.73	1.8	FALSE	0.5	74.7	1.8	1.1	82	90	0.148	7546	4828	0.67	0.18	0.82	1.19	0.81	Yes	Yes	Yes
	61.52	-23.1	134.9	0.82	0.63	7528	4600	0.7	57	2.0	0.50	84.06	1.9	FALSE	0.5	84.1	1.9	1.1	91	105	0.187	7566	4837	0.67	0.18	0.82	1.19	1.02	Yes	Yes	Yes
	61.68	-23.3	153.6	0.98	0.65	7548	4610	0.7	65	2.0	0.50	95.92	1.8	FALSE	0.5	95.9	1.8	1.1	104	116	0.226	7586	4847	0.67	0.18	0.82	1.19	1.24	Yes	Yes	Yes
	61.84	-23.4	98.7	1.13	1.19	7567	4619	0.7	41	2.3	0.50	60.70	2.1	FALSE	0.5	60.7	2.1	1.5	67	100	0.174	7605	4856	0.67	0.18	0.82	1.19	0.96	Yes	Yes	Yes
	62.01	-23.6	92.2	1.01	1.14	7587	4629	0.7	38	2.3	0.50	56.47	2.1	FALSE	0.5	56.5	2.1	1.5	62	95	0.161	7625	4866	0.67	0.18	0.82	1.19	0.88	Yes	Yes	Yes
	62.17	-23.8	96.1	0.60	0.65	7607	4638	0.7	40	2.1	0.50	58.92	2.0	FALSE	0.5	58.9	2.0	1.3	65	84	0.134	7645	4875	0.67	0.18	0.82	1.19	0.74	Yes	Yes	Yes
	62.34	-23.9	89.0	0.51	0.60	7626	4648	0.7	37	2.2	0.50	54.32	2.0	FALSE	0.5	54.3	2.0	1.3	60	78	0.124	7664	4885	0.67	0.18	0.82	1.19	0.68	Yes	Yes	Yes
	62.50	-24.1	72.2	0.29	0.43	7646	4657	0.7	29	2.2	0.50	43.56	2.0	FALSE	0.5	43.6	2.0	1.3	49	65	0.105	7684	4894	0.67	0.18	0.82	1.19	0.58	Yes	Yes	Yes
	62.66	-24.3	66.8	0.23	0.36	7666	4666	0.7	27	2.2	0.50	40.11	2.0	FALSE	0.5	40.1	2.0	1.3	45	60	0.100	7704	4904	0.66	0.18	0.82	1.19	0.55	Yes	Yes	Yes
	62.83	-24.4	65.4	0.18	0.30	7685	4676	0.7	26	2.2	0.50	39.15	2.0	FALSE	0.5	39.1	2.0	1.3	44	57	0.097	7723	4913	0.66	0.18	0.82	1.19	0.54	Yes	Yes	Yes
	62.99	-24.6	75.0	0.26	0.36	7705	4685	0.7	30	2.1	0.50	45.17	2.0	FALSE	0.5	45.2	2.0	1.3	50	64	0.104	7743	4922	0.66	0.18	0.82	1.19	0.58	Yes	Yes	Yes
	63.16	-24.8	97.4	1.25	1.33	7725	4695	0.7	40	2.3	0.50	59.35	2.2	FALSE	0.5	59.4	2.2	1.6	65	104	0.183	7763	4932	0.66	0.18	0.82	1.19	1.01	Yes	Yes	Yes
	63.32	-24.9	109.7	1.13	1.07	7744	4704	0.7	45	2.2	0.50	67.11	2.1	FALSE	0.5	67.1	2.1	1.4	74	102	0.180	7782	4941	0.66	0.18	0.82	1.19	0.99	Yes	Yes	Yes
	63.48	-25.1	107.3	0.57	0.55	7764	4714	0.7	44	2.1	0.50	65.51	1.9	FALSE	0.5	65.5	1.9	1.2	72	86	0.140	7802	4951	0.66	0.18	0.82	1.19	0.77	Yes	Yes	Yes
	63.65	-25.2	116.8	0.87	0.77	7784	4723	0.7	48	2.1	0.50	71.44	2.0	FALSE	0.5	71.4	2.0	1.2	78	98	0.166	7822	4960	0.66	0.18	0.82	1.19	0.92	Yes	Yes	Yes
	63.81	-25.4	115.4	0.76	0.68	7803	4733	0.7	47	2.1	0.50	70.46	1.9	FALSE	0.5	70.5	1.9	1.2	77	94	0.158	7841	4970	0.65	0.18	0.82	1.19	0.88	Yes	Yes	Yes
	63.98	-25.6	123.3	0.63	0.53	7823	4742	0.7	50	2.0	0.50	75.35	1.9	FALSE	0.5	75.3	1.9	1.1	82	94	0.158	7861	4979	0.65	0.18	0.82	1.19	0.88	Yes	Yes	Yes
	64.14	-25.7	111.5	0.09	0.09	7843	4752	0.7	45	1.8	0.50	67.84	1.7	FALSE	0.5	67.8	1.7	1.0	74	75	0.119	7881	4989	0.65	0.18	0.82	1.19	0.66	Yes	Yes	Yes
	64.30	-25.9	96.3	0.10	0.10	7862	4761	0.7	39	1.9	0.50	58.21	1.7	FALSE	0.5	58.2	1.7	1.1	64	68	0.109	7900	4998	0.65	0.18	0.82	1.19	0.60	Yes	Yes	Yes
	64.47	-26.1	77.7	0.15	0.20	7882	4770	0.7	31	2.0	0.50	46.45	1.9	FALSE	0.5	46.4	1.9	1.2	52	60	0.101	7920	5008	0.65	0.17	0.82	1.19	0.56	Yes	Yes	Yes
	64.63	-26.2	62.9	0.14	0.23	7902	4780	0.7	25	2.2	0.50	37.08	2.0	FALSE	0.5	37.1	2.0	1.3	42	54	0.094	7940	5017	0.65	0.17	0.82	1.19	0.53	Yes	Yes	Yes
	64.80	-26.4	40.9	0.27	0.73	7922	4789	0.7	15	2.5	0.50	23.18	2.4	FALSE	0.5	23.2	2.4	2.2	27	59	0.099	7960	5026	0.65	0.17	0.82	1.19	0.55	Yes	Yes	Yes
	64.96	-26.6	29.8	0.29	1.11	7941	4799	0.4	11	2.7	1.00	10.76	2.7	FALSE	1.0	10.8	2.7	4.4	13	57		7979	5036	0.65	0.17	0.81	1.19	100.00	No	Yes	No

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
	65.13	-26.7	21.5	0.27	1.57	7961	4808	0.4	7	3.0	1.00	7.28	3.0	FALSE	1.0	7.3	3.0	6.4	9	60		7999	5045	0.64	0.17	0.81	1.19	100.00	No	Yes	No
	65.29	-26.9	17.2	0.29	2.19	7981	4818	0.4	5	3.1	1.00	5.50	3.1	FALSE	1.0	5.5	3.1	8.5	8	64		8019	5055	0.64	0.17	0.81	1.19	100.00	No	Yes	No
	65.45	-27.1	16.3	0.29	2.40	8000	4827	0.4	5	3.2	1.00	5.08	3.2	FALSE	1.0	5.1	3.2	9.2	7	65		8038	5064	0.64	0.17	0.81	1.19	100.00	No	Yes	No
	65.62	-27.2	18.9	0.42	2.82	8020	4837	0.4	6	3.2	1.00	6.15	3.2	FALSE	1.0	6.1	3.2	8.7	8	72		8058	5074	0.64	0.17	0.81	1.19	100.00	No	Yes	No
	65.78	-27.4	21.0	0.52	3.06	8040	4846	0.4	7	3.1	1.00	7.02	3.1	FALSE	1.0	7.0	3.1	8.3	9	76		8078	5083	0.64	0.17	0.81	1.19	100.00	No	Yes	No
	65.95	-27.5	31.7	0.56	2.00	8059	4855	0.4	11	2.9	1.00	11.41	2.9	FALSE	1.0	11.4	2.9	5.2	14	73		8097	5093	0.64	0.17	0.81	1.19	100.00	No	Yes	No
	66.11	-27.7	43.6	0.56	1.42	8079	4865	0.4	16	2.6	1.00	16.27	2.6	FALSE	1.0	16.3	2.6	3.6	19	68		8117	5102	0.64	0.17	0.81	1.19	100.00	No	Yes	No
	66.27	-27.9	62.5	0.49	0.83	8099	4874	0.7	24	2.4	0.50	36.41	2.2	FALSE	0.5	36.4	2.2	1.7	41	71	0.113	8137	5111	0.63	0.17	0.81	1.19	0.64	Yes	Yes	Yes
	66.44	-28.0	67.1	0.35	0.55	8118	4884	0.7	26	2.3	0.50	39.22	2.1	FALSE	0.5	39.2	2.1	1.5	44	65	0.105	8156	5121	0.63	0.17	0.81	1.19	0.59	Yes	Yes	Yes
	66.60	-28.2	66.6	0.10	0.16	8138	4893	0.7	26	2.1	0.50	38.89	1.9	FALSE	0.5	38.9	1.9	1.2	44	53	0.094	8176	5130	0.63	0.17	0.81	1.19	0.53	Yes	Yes	Yes
	66.77	-28.4	64.8	0.07	0.11	8158	4903	0.7	25	2.1	0.50	37.71	1.9	FALSE	0.5	37.7	1.9	1.2	43	51	0.092	8196	5140	0.63	0.17	0.81	1.19	0.52	Yes	Yes	Yes
	66.93	-28.5	62.1	0.07	0.12	8177	4912	0.7	24	2.1	0.50	35.99	1.9	FALSE	0.5	36.0	1.9	1.2	41	50	0.092	8215	5149	0.63	0.17	0.81	1.19	0.52	Yes	Yes	Yes
	67.09	-28.7	59.2	0.08	0.14	8197	4922	0.7	22	2.2	0.50	34.16	2.0	FALSE	0.5	34.2	2.0	1.3	39	49	0.091	8235	5159	0.63	0.17	0.81	1.19	0.51	Yes	Yes	Yes
	67.26	-28.9	56.0	0.07	0.14	8217	4931	0.7	21	2.2	0.50	32.11	2.0	FALSE	0.5	32.1	2.0	1.3	37	47	0.090	8255	5168	0.63	0.17	0.81	1.19	0.51	Yes	Yes	Yes
	67.42	-29.0	54.0	0.07	0.13	8237	4940	0.7	20	2.2	0.50	30.87	2.0	FALSE	0.5	30.9	2.0	1.3	35	46	0.089	8275	5178	0.63	0.17	0.81	1.19	0.50	Yes	Yes	Yes
	67.59	-29.2	54.5	0.07	0.13	8256	4950	0.7	20	2.2	0.50	31.15	2.0	FALSE	0.5	31.1	2.0	1.3	36	47	0.089	8294	5187	0.62	0.17	0.81	1.19	0.50	Yes	Yes	Yes
	67.75	-29.3	55.7	0.07	0.14	8276	4959	0.7	21	2.2	0.50	31.82	2.0	FALSE	0.5	31.8	2.0	1.3	36	47	0.089	8314	5197	0.62	0.17	0.81	1.19	0.51	Yes	Yes	Yes
	67.91	-29.5	55.9	0.08	0.15	8296	4969	0.7	21	2.2	0.50	31.93	2.0	FALSE	0.5	31.9	2.0	1.3	36	48	0.090	8334	5206	0.62	0.17	0.81	1.19	0.51	Yes	Yes	Yes
	68.08	-29.7	56.2	0.08	0.16	8315	4978	0.7	21	2.2	0.50	32.04	2.0	FALSE	0.5	32.0	2.0	1.3	37	48	0.090	8353	5215	0.62	0.17	0.81	1.19	0.51	Yes	Yes	Yes
	68.24	-29.8	56.2	0.08	0.16	8335	4988	0.7	21	2.2	0.50	32.06	2.0	FALSE	0.5	32.1	2.0	1.3	37	48	0.090	8373	5225	0.62	0.17	0.81	1.19	0.51	Yes	Yes	Yes
	68.41	-30.0	56.1	0.08	0.16	8355	4997	0.7	21	2.2	0.50	31.90	2.0	FALSE	0.5	31.9	2.0	1.3	36	48	0.090	8393	5234	0.62	0.17	0.81	1.19	0.51	Yes	Yes	Yes
	68.57	-30.2	55.7	0.08	0.16	8374	5007	0.7	21	2.2	0.50	31.64	2.0	FALSE	0.5	31.6	2.0	1.3	36	48	0.090	8412	5244	0.62	0.17	0.81	1.19	0.51	Yes	Yes	Yes
	68.73	-30.3	55.3	0.07	0.14	8394	5016	0.6	20	2.2	0.50	31.35	2.0	FALSE	0.5	31.3	2.0	1.3	36	47	0.089	8432	5253	0.61	0.17	0.81	1.19	0.51	Yes	Yes	Yes
	68.90	-30.5	55.9	0.07	0.13	8414	5026	0.6	21	2.2	0.50	31.73	2.0	FALSE	0.5	31.7	2.0	1.3	36	47	0.089	8452	5263	0.61	0.17	0.81	1.19	0.51	Yes	Yes	Yes
	69.06	-30.7	56.8	0.07	0.13	8433	5035	0.6	21	2.2	0.50	32.23	2.0	FALSE	0.5	32.2	2.0	1.3	37	47	0.089	8471	5272	0.61	0.17	0.81	1.19	0.51	Yes	Yes	Yes
	69.23	-30.8	55.8	0.07	0.13	8453	5044	0.6	20	2.2	0.50	31.58	2.0	FALSE	0.5	31.6	2.0	1.3	36	47	0.089	8491	5282	0.61	0.17	0.80	1.19	0.51	Yes	Yes	Yes
	69.39	-31.0	54.2	0.07	0.13	8473	5054	0.6	20	2.2	0.50	30.58	2.0	FALSE	0.5	30.6	2.0	1.3	35	46	0.089	8511	5291	0.61	0.17	0.80	1.19	0.51	Yes	Yes	Yes
	69.55	-31.2	52.2	0.03	0.05	8492	5063	0.6	19	2.2	0.50	29.30	2.0	FALSE	0.5	29.3	2.0	1.3	34	45	0.087	8530	5300	0.61	0.17	0.80	1.19	0.50	Yes	Yes	Yes
	69.72	-31.3	52.2	0.03	0.05	8512	5073	0.6	19	2.2	0.50	29.25	2.0	FALSE	0.5	29.3	2.0	1.3	34	45	0.087	8550	5310	0.61	0.17	0.80	1.19	0.50	Yes	Yes	Yes
	69.88	-31.5	51.1	0.03	0.06	8532	5082	0.6	18	2.2	0.50	28.54	2.0	FALSE	0.5	28.5	2.0	1.3	33	44	0.087	8570	5319	0.61	0.17	0.80	1.19	0.50	Yes	Yes	Yes
	70.05	-31.6	50.7	0.05	0.10	8552	5092	0.6	18	2.2	0.50	28.26	2.0	FALSE	0.5	28.3	2.0	1.3	33	44	0.087	8590	5329	0.60	0.17	0.80	1.19	0.50	Yes	Yes	Yes
	70.21	-31.8	49.8	0.06	0.14	8571	5101	0.6	18	2.2	0.50	27.73	2.1	FALSE	0.5	27.7	2.1	1.4	32	45	0.087	8609	5338	0.60	0.17	0.80	1.19	0.50	Yes	Yes	Yes
	70.37	-32.0	52.9	0.06	0.12	8591	5111	0.6	19	2.2	0.50	29.55	2.0	FALSE	0.5	29.5	2.0	1.3	34	45	0.088	8629	5348	0.60	0.17	0.80	1.19	0.51	Yes	Yes	Yes
	70.54	-32.1	61.2	0.04	0.08	8611	5120	0.6	22	2.1	0.50	34.54	1.9	FALSE	0.5	34.5	1.9	1.2	39	48	0.090	8649	5357	0.60	0.16	0.80	1.19	0.52	Yes	Yes	Yes
	70.70	-32.3	69.0	0.05	0.08	8630	5129	0.6	25	2.1	0.50	39.26	1.9	FALSE	0.5	39.3	1.9	1.2	44	52	0.093	8668	5367	0.60	0.16	0.80	1.19	0.54	Yes	Yes	Yes
	70.87	-32.5	64.9	0.07	0.12	8650	5139	0.6	24	2.1	0.50	36.75	1.9	FALSE	0.5	36.8	1.9	1.2	42	51	0.092	8688	5376	0.60	0.16	0.80	1.19	0.53	Yes	Yes	Yes
	71.03	-32.6	64.2	0.09	0.16	8670	5148	0.6	23	2.1	0.50	36.25	2.0	FALSE	0.5	36.3	2.0	1.2	41	51	0.092	8708	5385	0.60	0.16	0.80	1.19	0.54	Yes	Yes	Yes
	71.19	-32.8	69.3	0.14	0.21	8689	5158	0.6	25	2.1	0.50	39.30	2.0	FALSE	0.5	39.3	2.0	1.2	44	55	0.096	8727	5395	0.59	0.16	0.80	1.19	0.56	Yes	Yes	Yes
	71.36	-33.0	71.5	0.11	0.16	8709	5167	0.6	26	2.1	0.50	40.62	1.9	FALSE	0.5	40.6	1.9	1.2	46	55	0.095	8747	5404	0.59	0.16	0.80	1.19	0.56	Yes	Yes	Yes
	71.52	-33.1	63.1	0.03	0.06	8729	5177	0.6	23	2.1	0.50	35.48	1.9	FALSE	0.5	35.5	1.9	1.2	40	49	0.091	8767	5414	0.59	0.16	0.80	1.19	0.53	Yes	Yes	Yes
	71.69	-33.3	57.4	0.07	0.14	8748	5186	0.6	20	2.2	0.50	31.99	2.0	FALSE	0.5	32.0	2.0	1.3	37	48	0.090	8786	5423	0.59	0.16	0.80	1.19	0.52	Yes	Yes	Yes
	71.85	-33.5	45.4	0.27	0.66	8768	5196	0.6	16	2.5	0.50	24.77	2.3	FALSE	0.5	24.8	2.3	2.0	29	59	0.099	8806	5433	0.59	0.16	0.80	1.19	0.58	Yes	Yes	Yes
	72.01	-33.6	30.5	0.16	0.61	8788	5205	0.4	10	2.7	1.00	10.02	2.7	FALSE	1.0	10.0	2.7	3.8	12	47		8826	5442	0.59	0.16	0.80	1.19	100.00	No	Yes	No
	72.18	-33.8	32.6	0.40	1.43	8807	5214	0.4	11	2.8	1.00	10.81	2.8	FALSE	1.0	10.8	2.8	4.8	13	63		8845	5452	0.59	0.16	0.80	1.19	100.00	No	Yes	No
	72.34	-33.9	22.4	0.40	2.24	8827	5224	0.4	7	3.1	1.00	6.90	3.1	FALSE	1.0	6.9	3.1	7.5	9	68		8865	5461	0.59	0.16	0.80	1.19	100.00	No	Yes	No
	72.51	-34.1	15.3	0.16	1.51	8847	5233	0.4	4	3.2	1.00	4.16	3.2	FALSE	1.0	4.2	3.2	8.9	6	55		8885	5471	0.58	0.16	0.80	1.19	100.00	No	Yes	No
	72.67	-34.3	11.8	0.10	1.37	8867	5243	0.4	3	3.3	1.00	2.81	3.3	FALSE	1.0	2.8	3.3	10.9	5	52		8905	5480	0.58	0.16	0.80	1.19	100.00	No	Yes	No
	72.84	-34.4	11.3	0.05	0.71	8886	5252	0.4	3	3.2	1.00	2.63	3.2	FALSE	1.0	2.6	3.2	9.7	5	44		8924	5489	0.58	0.16	0.80	1.19	100.00	No	Yes	No
	73.00	-34.6	10.5	0.04	0.58	8906	5262	0.4	2	3.3	1.00	2.31	3.3	FALSE	1.0	2.3	3.3	10.1	4	43		8944	5499	0.58	0.16	0.80	1.19	100.00	No	Yes	No
	73.16	-34.8	9.4	0.04	0.80	8926	5271	0.4	2	3.4	1.00	1.86	3.4	FALSE	1.0	1.9	3.4	12.2	4	46		8964	5508	0.58	0.16	0.80	1.19	100.00	No	Yes	No
	73.33	-34.9	9.7	0.02	0.46	8945	5281	0.4	2	3.3	1.00	1.96	3.3	FALSE	1.0	2.0	3.3	10.7	4	41		8983	5518	0.58	0.16	0.80	1.19	100.00	No	Yes	No
	73.49	-35.1	9.7	0.03	0.63	8965	5290	0.4	2	3.3	1.00	1.98	3.3	FALSE	1.0	2.0	3.3	11.2	4	44		9003	5527	0.58	0.16	0.80	1.19	100.00	No	Yes	No
	73.66	-35.3	9.7	0.10	1.84	8985	5300	0.4	2	3.5	1.00	1.97	3.5	FALSE	1.0	2.0	3.5	14.2	4	55		9023	5537	0.57	0.16	0.79	1.19	100.00	No	Yes	No
	73.82	-35.4	9.3	0.20	4.19	9004	5309	0.4	2	3.7	1.00	1.81	3.7	FALSE	1.0	1.8	3.7	18.1	4	67		9042	5546	0.57	0.16	0.79	1.19	100.00	No	Yes	No
	73.98	-35.6	54.0	0.16	0.32	9024	5318	0.6	19	2.3	0.50	29.53	2.1	FALSE	0.5	29.5	2.1	1.5	34	51	0.093	9062	5556	0.57	0.16	0.79	1.19	0.55	Yes	Yes	Yes
	74.15	-35.7	57.8	0.17	0.31	9044	5328	0.6	20	2.3	0.50	31.71	2.1	FALSE	0.5	31.7	2.1	1.4	36	53	0.094	9082	5565	0.57	0.16	0.79	1.19	0.56	Yes	Yes	Yes
	74.31	-35.9	61.7	0.12	0.21	9063	5337	0.6	21	2.2	0.50	34.05	2.0	FALSE	0.5	34.1	2.0	1.3	39	51	0.092	9101	5574	0.57	0.16	0.79	1.19	0.55	Yes	Yes	Yes
	74.48	-36.1	61.1	1.19	2.11	9083	5347	0.4	21	2.6	1.00	21.14	2.6	FALSE	1.0	21.1	2.6	3.6	24	87		9121	5584	0.57	0.16	0.79	1.19	100.00	No	Yes	No
	74.64	-36.2	62.8	0.47	0.80	9103	5356	0.6	22	2.4	0.50	34.58	2.2	FALSE	0.5	34.6	2.2	1.8	39	69	0.111	9141	5593	0.57	0.16	0.79	1.19	0.67	Yes	Yes	Yes
	74.80	-36.4	69.3	0.69	1.06	9122	5366	0.6	24	2.4	0.50	38.44	2.3	FALSE	0.5	38.4	2.3	1.8	44	79	0.127	9160	5603	0.57	0.16	0.79	1.19	0.76	Yes	Yes	Yes
	74.97	-36.6	97.3	0.78	0.84	9142	5375	0.6	35	2.2	0.50	55.02	2.1	FALSE	0.5	55.0	2.1	1.4	61	86	0.139	9180	5612	0.56	0.16	0.79	1.19	0.84	Yes	Yes	Yes
	75.13	-36.7	95.3	0.59	0.65	9162	5385	0.6	34	2.2	0.50	53.76	2.0	FALSE	0.5	53.8	2.0	1.3	60	80	0.127	9200	5622	0.56	0.16	0.79	1.19	0.76	Yes	Yes	Yes
	75.30	-36.9	79.5	0.38	0.51	9181	5394	0.6	28	2.2	0.50	44.34	2.0	FALSE	0.5	44.3	2.0	1.4	50	68	0.109	9219	5631	0.56	0.16	0.79	1.19	0.66	Yes	Yes	Yes
	75.46	-37.1	83.5	0.27	0.34	9201	5403	0.6	29	2.1	0.50	46.69	2.0	FALSE	0.5	46.7	2.0	1.2	52	65	0.105	9239	5641	0.56	0.16	0.79	1.19	0.64	Yes	Yes	Yes
	75.62	-37.2	85.1	0.22	0.27	9221	5413	0.6	30	2.1	0.50	47.54	1.9	FALSE	0.5	47.5	1.9	1.2	53	64	0.104	9259	5650	0.56	0.16	0.79	1.19	0.63	Yes	Yes	Yes
	75.79	-37.4	84.9	0.17	0.21	9240	5422	0.6	30	2.1	0.50	47.43	1.9	FALSE	0.5	47.4	1.9	1.2	53	62	0.102	9278	5659	0.56	0.16	0.79	1.19	0.62	Yes	Yes	Yes
	75.95	-37.6	77.5	0.16	0.22	9260	5432	0.6	27	2.1	0.50	42.98	1.9	FALSE	0.5	43.0	1.9	1.2	48	58	0.099	9298	5669	0.56	0.16	0.79	1.19	0.59	Yes	Yes	Yes
	76.12	-37.7	71.3	0.16	0.24	9280	5441	0.6	25	2.2	0.50	39.29	2.0	FALSE	0.5	39.3	2.0	1.3	44	56	0.096	9318	5678	0.56	0.16	0.79	1.19	0.58	Yes	Yes	Yes
	76.28	-37.9	65.5	0.17	0.27	9300	5451	0.6	22	2.2	0.50	35.85	2.0	FALSE	0.5	35.8	2.0	1.3	41	54	0.095	9338	5688	0.56	0.16	0.79	1.19	0.57	Yes	Yes	Yes
	76.44	-38.0	61.7	0.20	0.35	9319	5460	0.6	21	2.3	0.50	33.59	2.1	FALSE	0.5	33.6	2.1	1.4	38	55	0.095	9357	5697	0.56	0.16	0.79	1.19	0.57	Yes	Yes	Yes
	76.61	-38.2	64.8	0.17	0.28	9339	5470	0.6	22	2.2	0.50	35.36	2.0	FALSE	0.5	35.4	2.0	1.3	40	54	0.095	9377	5707	0.56	0.16	0.79	1.19	0.57	Yes	Yes	Yes
	76.77	-38.4	67.9	0.16	0.26	9359	5479	0.6	23	2.2	0.50	37.12	2.0	FALSE	0.5	37.1	2.0	1.3	42	55	0.095	9397	5716	0.56	0.16	0.79	1.19	0.57	Yes	Yes	Yes
	76.94	-38.5	67.0	0.33	0.53	9378	5489	0.6	23	2.3	0.50	36.56	2.1	FALSE	0.5	36.6	2.1	1.5	42	63	0.103	9416	5726	0.56	0.16	0.79	1.19	0.62	Yes	Yes	Yes
	77.10	-38.7	64.7	0.37	0.61	9398	5498	0.6	22	2.4	0.50	35.17	2.2	FALSE	0.5	35.2	2.2	1.6	40	64	0.104	9436	5735	0.56	0.16	0.79	1.19	0.63	Yes	Yes	Yes
	77.26	-38.9	90.4	0.69	0.81	9418	5507	0.6	31	2.3	0.50	50.20	2.1	FALSE	0.5	50.2	2.1	1.4	56	81	0.130	9456	5745	0.56	0.16	0.79	1.19	0.78	Yes	Yes	Yes
	77.43	-39.0	105.4	0.34	0.33	9437	5517	0.6	36	2.0	0.50	58.92	1.9	FALSE	0.5	58.9	1.9	1.1	65	75	0.119	9475	5754	0.56	0.16	0.79	1.19	0.71	Yes	Yes	Yes
	77.59	-39.2	108.5	0.59	0.57	9457	5526	0.6	38	2.1	0.50	60.72	1.9	FALSE	0.5	60.7	1.9	1.2	67	83	0.133	9495	5763	0.56	0.16	0.79	1.19	0.80	Yes	Yes	Yes
	77.76	-39.4	89.3	0.48	0.57	9477	5536	0.6	31	2.2	0.50	49.39	2.0	FALSE	0.5	49.4	2.0	1.3	55	74	0.117	9515	5773	0.56	0.16	0.79	1.19	0.70	Yes	Yes	Yes
	77.92	-39.5	80.6	0.42	0.56	9496	5545	0.6	27	2.3	0.50	44.29	2.1	FALSE	0.5	44.3	2.1	1.4	50	69	0.111	9534	5782	0.56	0.16	0.79	1.19	0.66	Yes	Yes	Yes
	78.08	-39.7	82.6	0.17	0.21	9516	5555	0.6	28	2.1	0.50	45.42	1.9	FALSE	0.5	45.4	1.9	1.2	51	60	0.100	9554	5792	0.56	0.16	0.79	1.19	0.60	Yes	Yes	Yes
	78.25	-39.8	85.4	0.09	0.12	9536	5564	0.6	29	2.0	0.50	47.02	1.8	FALSE	0.5	47.0	1.8	1.1	53	59	0.099	9574	5801	0.56	0.16	0.79	1.19	0.59	Yes	Yes	Yes
	78.41	-40.0	78.9	0.05	0.07	9555	5574	0.6	27	2.1	0.50	43.15	1.8	FALSE	0.5	43.1	1.8	1.1	49	56	0.096	9593	5811	0.56	0.16	0.78	1.19	0.57	Yes	Yes	Yes
	78.58	-40.2	69.1	0.05	0.08	9575	5583	0.6	23	2.1	0.50	37.44	1.9	FALSE	0.5	37.4	1.9	1.2	43	51	0.092	9613	5820	0.56	0.16	0.78	1.19	0.55	Yes	Yes	Yes
	78.74	-40.3	55.6	0.14	0.27	9595	5592	0.6	18	2.3	0.50	29.53	2.1	FALSE	0.5	29.5	2.1	1.5	34	50	0.092	9633	5830	0.56	0.16	0.78	1.19	0.54	Yes	Yes	Yes
	78.90	-40.5	36.3	0.32	1.02	9614	5602	0.4	11	2.7	1.00	11.24	2.7	FALSE	1.0	11.2	2.7	4.1	14	56		9652	5839	0.56	0.16	0.78	1.19	100.00	No	Yes	No
	79.07	-40.7	23.4	0.33	1.78	9634	5611	0.4	7	3.0	1.00	6.63	3.0	FALSE	1.0	6.6	3.0	7.1	9	62		9672	5848	0.56	0.16	0.78	1.19	100.00	No	Yes	No
	79.23	-40.8	18.6	0.26	1.85	9654	5621	0.4	5	3.2	1.00	4.90	3.2	FALSE	1.0	4.9	3.2	8.6	7	60		9692	5858	0.56	0.16	0.78	1.19	100.00	No	Yes	No
	79.40	-41.0	13.5	0.22	2.59	9674	5630	0.4	3	3.4	1.00	3.06	3.4	FALSE	1.0	3.1	3.4	12.4	5	62		9712	5867	0.56	0.16	0.78	1.19	100.00	No	Yes	No
	79.56	-41.2	12.4	0.13	1.72	9693	5640	0.4	3	3.4	1.00	2.69	3.4	FALSE	1.0	2.7	3.4	11.8	5	55		9731	5877	0.56	0.16	0.78	1.19	100.00	No	Yes	No
	79.72	-41.3	13.3	0.11	1.34	9713	5649	0.4	3	3.3	1.00	2.98	3.3	FALSE	1.0	3.0	3.3	10.5	5	52		9751	5886	0.56	0.16	0.78	1.19	100.00	No	Yes	No
	79.89	-41.5	11.7	0.11	1.57	9733	5659	0.4	2	3.4	1.00	2.40	3.4	FALSE	1.0	2.4	3.4	12.3	4	54		9771	5896	0.56	0.16	0.78	1.19	100.00	No	Yes	No
	80.05	-41.7	22.8	0.65	3.63	9752	5668	0.4	6	3.2	1.00	6.31	3.2	FALSE	1.0	6.3	3.2	9.4	8	80		9790	5905	0.56	0.16	0.78	1.19	100.00	No	Yes	No

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																											Kσ	MSF				
	80.22	-41.8	43.4	0.42	1.09	9772	5678	0.4	14	2.7	1.00	13.58	2.7	FALSE	1.0	13.6	2.7	3.7	16	59		9810	5915	0.56	0.16	0.78	1.19	100.00	No	Yes	No
	80.38	-42.0	239.6	0.44	0.19	9792	5687	0.6	83	1.6	0.50	135.33	1.4	FALSE	0.5	135.3	1.4	1.0	146	146	0.370	9830	5924	0.56	0.16	0.78	1.19	2.18	Yes	Yes	No
	80.55	-42.1	212.1	1.96	0.95	9811	5696	0.6	73	2.0	0.50	119.33	1.8	FALSE	0.5	119.3	1.8	1.1	129	147	0.373	9849	5934	0.56	0.16	0.78	1.19	2.19	Yes	Yes	No
	80.71	-42.3	212.1	2.38	1.15	9831	5706	0.6	73	2.1	0.50	119.26	1.9	FALSE	0.5	119.3	1.9	1.2	129	153	0.411	9869	5943	0.56	0.16	0.78	1.19	2.41	Yes	Yes	No
	80.87	-42.5	314.5	2.43	0.79	9851	5715	0.6	108	1.8	0.50	178.02	1.7	FALSE	0.5	178.0	1.7	1.0	191	192	0.600	9889	5952	0.56	0.16	0.78	1.19	3.52	Yes	Yes	No
	81.04	-42.6	305.6	2.67	0.89	9870	5725	0.6	105	1.9	0.50	172.76	1.7	FALSE	0.5	172.8	1.7	1.0	186	193	0.600	9908	5962	0.56	0.16	0.78	1.19	3.52	Yes	Yes	No
	81.20	-42.8	313.8	2.69	0.87	9890	5734	0.6	108	1.8	0.50	177.33	1.7	FALSE	0.5	177.3	1.7	1.0	191	196	0.600	9928	5971	0.56	0.16	0.78	1.19	3.52	Yes	Yes	No
	81.37	-43.0	304.6	2.61	0.87	9910	5744	0.6	104	1.9	0.50	171.93	1.7	FALSE	0.5	171.9	1.7	1.0	185	191	0.600	9948	5981	0.56	0.16	0.78	1.19	3.52	Yes	Yes	No
	81.53	-43.1	313.1	2.62	0.85	9929	5753	0.6	107	1.8	0.50	176.62	1.7	FALSE	0.5	176.6	1.7	1.0	190	194	0.600	9967	5990	0.56	0.16	0.78	1.19	3.51	Yes	Yes	No
	81.69	-43.3	311.6	2.61	0.85	9949	5763	0.6	106	1.8	0.50	175.60	1.7	FALSE	0.5	175.6	1.7	1.0	189	193	0.600	9987	6000	0.56	0.16	0.78	1.19	3.51	Yes	Yes	No
	81.86	-43.5	313.1	2.80	0.91	9969	5772	0.6	107	1.9	0.50	176.35	1.7	FALSE	0.5	176.4	1.7	1.0	190	197	0.600	10007	6009	0.56	0.16	0.78	1.19	3.51	Yes	Yes	No
	82.02	-43.6	313.5	2.82	0.91	9989	5781	0.6	107	1.9	0.50	176.39	1.7	FALSE	0.5	176.4	1.7	1.0	190	197	0.600	10027	6019	0.56	0.16	0.78	1.19	3.50	Yes	Yes	No
	82.19	-43.8	312.7	2.92	0.95	10008	5791	0.6	106	1.9	0.50	175.77	1.7	FALSE	0.5	175.8	1.7	1.0	189	198	0.600	10046	6028	0.56	0.16	0.78	1.19	3.50	Yes	Yes	No
	82.35	-43.9	317.0	2.80	0.90	10028	5800	0.6	108	1.9	0.50	178.10	1.7	FALSE	0.5	178.1	1.7	1.0	191	198	0.600	10066	6037	0.56	0.16	0.78	1.19	3.50	Yes	Yes	No
	82.51	-44.1	313.5	2.96	0.96	10048	5810	0.6	106	1.9	0.50	175.94	1.7	FALSE	0.5	175.9	1.7	1.0	189	198	0.600	10086	6047	0.56	0.16	0.78	1.19	3.50	Yes	Yes	No
	82.68	-44.3	319.9	3.20	1.02	10067	5819	0.6	108	1.9	0.50	179.47	1.7	FALSE	0.5	179.5	1.7	1.1	193	204	0.600	10105	6056	0.56	0.16	0.78	1.19	3.49	Yes	Yes	No
	82.84	-44.4	315.4	3.15	1.01	10087	5829	0.6	106	1.9	0.50	176.75	1.7	FALSE	0.5	176.8	1.7	1.1	190	201	0.600	10125	6066	0.56	0.16	0.78	1.19	3.49	Yes	Yes	No
	83.01	-44.6	344.8	3.32	0.98	10107	5838	0.6	116	1.9	0.50	193.33	1.7	FALSE	0.5	193.3	1.7	1.0	208	214	0.600	10145	6075	0.56	0.16	0.78	1.19	3.49	Yes	Yes	No

Project: I Street Bridge Replacement
Client: Mark Thomas and Company
Subject: EQ Analysis - I Street Bridge

Factors of Safety against Liquefaction
WM0004_0014C - I Street Bridge, Sacramento

Purpose: Evaluate susceptibility of sand-like soils to liquefaction.

Method: Use the "simplified procedure" practice for evaluating liquefaction of resistance of soils based on CPT results. The equations are based on the technical update presented in Reference 1 and are listed at the end of the spreadsheet.

References:
1) Youd, T. L. et al. (2001). "Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils". J. Geotech. and Geoenv. Engrg., ASCE, 127(4):297-313.

Assumptions:

Unit Wt. of Sand, Silt & Gravel above GWT, γ [pcf]	130.0	Assumed value based on coarser-grained units close to the ground surface
Unit Wt. of Sand, Silt & Gravel below GWT, γ [pcf]	120.0	Assumed value based on finer-grained units further from the ground surface
Earthquake magnitude	7	Magnitude is assumed based off previous WSAFCA Study
Depth to Groundwater at Time of Drilling (ft)	30.8	
Depth to Groundwater for Design (ft)	19.2	
Ground Surface Elevation	39.20	Ground Surface Elevation Listed on CPT log
Earthquake PGA (g)	0.262	

Youd et al 2001 Eqn. No.	Equation
12, 13	$q_{c1N} = C_Q(q_c/p_{atm})$ where $C_Q = (p_{atm}/\sigma'_{vo})^n$
18, 19	$q_{c1Ncs} = K_c q_{c1N}$ where $K_c = -0.403I_c^4 + 5.581I_c^3 - 21.63I_c^2 + 33.75I_c - 17.88$ for $I_c > 1.64$; $K_c = 1.0$ for $I_c <= 1.64$
11a,b	$CRR_{7.5} =$ $0.833(q_{c1Ncs}/1000) + 0.05$ for $q_{c1Ncs} < 50$; $93(q_{c1Ncs}/1000)^3 + 0.08$ for $50 \le q_{c1Ncs} < 160$; 0.60 for $q_{c1Ncs} \ge 160$
1	$CSR = \tau_{av} / \sigma'_{vo,b} = 0.65\,(a_{max}/g)(\sigma_{o,t,b}/\sigma'_{vo,b})r_d$
24	$MSF = 10^{2.24} / Mw^{2.56}$
31	$K_\sigma = [(\sigma'_v)_b / P_a]^{(f-1)}$ where f = 0.75 for an assumed relative density of 50%
30	$FS = (CRR_{7.5} / CSR) * MSF * K_\sigma$

Notes:
1) Highlighted = cell which is input by the user (cells not highlighted are computed by Excel).
2) Qt1 is the normalized cone tip resistance for an exponent n equal to 1.0. This is also equal to the conventional normalized tip resistance, Q, as has been previously used (e.g. Robertson 1990).
3) Ic (n=1) indicates that the soil behavior type index Ic is calculated by assuming n is equal to 1.0. Ic is defined in equation 14 of Youd et al. 2001.
4) $(\sigma'_{vo})_a$ is the vertical effective stress computed using the depth to water at the time of drilling.
5) $(\sigma'_v)_b$ is the vertical effective sress computed using the depth to water during the earthquake.
6) If Ic (n=1) is less than 2.6 and the updated Ic (column Q) is greater than 2.6, set n to 0.7 and recalculate Qtn and Ic
7)
8) Ic < 2.6 is the nominal range of liquefiable soils, per the Robertson and Wride (1998) method.
9) Data points with Ic > 2.6 are included in the triggering evaluations if the exponent n is manually set to 0.7 to be consistent with SPT or laboratory classification of soils.

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{vo} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
							Note 4		Note 2	Note 3				Note 6									Note 5						Note 8		Note 9
	5.10	34.1	23.0	0.20	0.88	663	663	1.7	68	2.0	0.50	38.28	2.2	FALSE	0.5	38.3	2.2	1.7	39	67	0.108	663	663	0.99	0.17	1.00	1.19	0.76	Yes	No	No
	5.20	34.0	22.5	0.00	0.00	676	676	1.7	66	1.7	0.50	37.06	1.9	FALSE	0.5	37.1	1.9	1.2	38	46	0.088	676	676	0.99	0.17	1.00	1.19	0.63	Yes	No	No
	5.40	33.8	22.0	0.10	0.46	702	702	1.7	62	1.9	0.50	35.53	2.1	FALSE	0.5	35.5	2.1	1.5	37	55	0.096	702	702	0.99	0.17	1.00	1.19	0.68	Yes	No	No
	5.60	33.6	20.0	0.10	0.51	728	728	1.7	54	2.0	0.50	31.64	2.2	FALSE	0.5	31.6	2.2	1.6	34	55	0.095	728	728	0.99	0.17	1.00	1.19	0.68	Yes	No	No
	5.70	33.5	17.3	0.10	0.59	741	741	1.7	46	2.1	0.50	27.04	2.3	FALSE	0.5	27.0	2.3	1.8	29	54	0.095	741	741	0.99	0.17	1.00	1.19	0.67	Yes	No	No
	5.90	33.3	14.3	0.10	0.72	767	767	1.7	36	2.2	0.50	21.85	2.4	FALSE	0.5	21.8	2.4	2.3	24	54	0.094	767	767	0.99	0.17	1.00	1.19	0.67	Yes	No	No
	6.10	33.1	14.4	0.10	0.71	793	793	1.6	35	2.2	0.50	21.62	2.4	FALSE	0.5	21.6	2.4	2.3	24	53	0.094	793	793	0.99	0.17	1.00	1.19	0.67	Yes	No	No
	6.20	33.0	20.4	0.10	0.50	806	806	1.6	50	2.0	0.50	30.62	2.2	FALSE	0.5	30.6	2.2	1.6	33	54	0.095	806	806	0.99	0.17	1.00	1.19	0.67	Yes	No	No
	6.40	32.8	24.7	0.10	0.41	832	832	1.6	58	1.9	0.50	36.60	2.1	FALSE	0.5	36.6	2.1	1.4	39	56	0.096	832	832	0.99	0.17	1.00	1.19	0.68	Yes	No	No
	6.60	32.6	25.9	0.20	0.79	858	858	1.6	59	2.0	0.50	37.81	2.2	FALSE	0.5	37.8	2.2	1.7	41	67	0.109	858	858	0.98	0.17	1.00	1.19	0.77	Yes	No	No
	6.70	32.5	26.6	0.10	0.38	871	871	1.6	60	1.9	0.50	38.55	2.0	FALSE	0.5	38.5	2.0	1.4	41	57	0.097	871	871	0.98	0.17	1.00	1.19	0.69	Yes	No	No
	6.90	32.3	28.5	0.20	0.71	897	897	1.5	63	2.0	0.50	40.72	2.1	FALSE	0.5	40.7	2.1	1.5	44	68	0.109	897	897	0.98	0.17	1.00	1.19	0.78	Yes	No	No
	7.10	32.1	27.6	0.20	0.74	923	923	1.5	59	2.0	0.50	38.84	2.2	FALSE	0.5	38.8	2.2	1.6	42	67	0.108	923	923	0.98	0.17	1.00	1.19	0.77	Yes	No	No
	7.20	32.0	26.2	0.10	0.39	936	936	1.5	55	1.9	0.50	36.57	2.1	FALSE	0.5	36.6	2.1	1.4	39	55	0.096	936	936	0.98	0.17	1.00	1.19	0.68	Yes	No	No
	7.40	31.8	25.6	0.10	0.40	962	962	1.5	52	1.9	0.50	35.21	2.1	FALSE	0.5	35.2	2.1	1.4	38	55	0.095	962	962	0.98	0.17	1.00	1.19	0.68	Yes	No	No
	7.50	31.7	24.8	0.10	0.41	975	975	1.5	50	2.0	0.50	33.85	2.1	FALSE	0.5	33.9	2.1	1.5	37	54	0.095	975	975	0.98	0.17	1.00	1.19	0.67	Yes	No	No
	7.70	31.5	24.3	0.10	0.42	1001	1001	1.5	48	2.0	0.50	32.71	2.1	FALSE	0.5	32.7	2.1	1.5	35	53	0.094	1001	1001	0.98	0.17	1.00	1.19	0.67	Yes	No	No
	7.90	31.3	24.9	0.10	0.41	1027	1027	1.4	47	2.0	0.50	33.09	2.1	FALSE	0.5	33.1	2.1	1.5	36	53	0.094	1027	1027	0.98	0.17	1.00	1.19	0.67	Yes	No	No
	8.00	31.2	25.2	0.10	0.41	1040	1040	1.4	47	2.0	0.50	33.27	2.1	FALSE	0.5	33.3	2.1	1.5	36	53	0.094	1040	1040	0.98	0.17	1.00	1.19	0.67	Yes	No	No
	8.20	31.0	25.3	0.10	0.40	1066	1066	1.4	46	2.0	0.50	32.98	2.1	FALSE	0.5	33.0	2.1	1.5	36	53	0.094	1066	1066	0.98	0.17	1.00	1.19	0.67	Yes	No	No
	8.40	30.8	25.3	0.10	0.40	1092	1092	1.4	45	2.0	0.50	32.57	2.1	FALSE	0.5	32.6	2.1	1.5	35	53	0.094	1092	1092	0.98	0.17	1.00	1.19	0.67	Yes	No	No
	8.50	30.7	25.0	0.10	0.41	1105	1105	1.4	44	2.0	0.50	31.98	2.1	FALSE	0.5	32.0	2.1	1.5	35	53	0.094	1105	1105	0.98	0.17	1.00	1.19	0.67	Yes	No	No
	8.70	30.5	24.2	0.10	0.42	1131	1131	1.4	42	2.0	0.50	30.56	2.2	FALSE	0.5	30.6	2.2	1.6	33	52	0.093	1131	1131	0.98	0.17	1.00	1.19	0.67	Yes	No	No
	8.90	30.3	23.5	0.10	0.44	1157	1157	1.4	40	2.1	0.50	29.30	2.2	FALSE	0.5	29.3	2.2	1.6	32	51	0.093	1157	1157	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	9.00	30.2	23.6	0.10	0.43	1170	1170	1.3	39	2.1	0.50	29.25	2.2	FALSE	0.5	29.3	2.2	1.6	32	51	0.093	1170	1170	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	9.20	30.0	23.4	0.10	0.44	1196	1196	1.3	38	2.1	0.50	28.67	2.2	FALSE	0.5	28.7	2.2	1.6	31	51	0.092	1196	1196	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	9.40	29.8	24.2	0.10	0.42	1222	1222	1.3	39	2.1	0.50	29.34	2.2	FALSE	0.5	29.3	2.2	1.6	32	51	0.092	1222	1222	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	9.50	29.7	24.9	0.10	0.41	1235	1235	1.3	39	2.1	0.50	30.04	2.2	FALSE	0.5	30.0	2.2	1.6	33	51	0.093	1235	1235	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	9.70	29.5	24.5	0.10	0.42	1261	1261	1.3	38	2.1	0.50	29.23	2.2	FALSE	0.5	29.2	2.2	1.6	32	51	0.092	1261	1261	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	9.80	29.4	23.3	0.10	0.44	1274	1274	1.3	36	2.1	0.50	27.61	2.2	FALSE	0.5	27.6	2.2	1.7	30	50	0.092	1274	1274	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	10.00	29.2	20.8	0.10	0.50	1300	1300	1.3	31	2.2	0.50	24.30	2.3	FALSE	0.5	24.3	2.3	1.9	27	50	0.091	1300	1300	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	10.20	29.0	18.5	0.10	0.56	1326	1326	1.3	27	2.3	0.50	21.30	2.4	FALSE	0.5	21.3	2.4	2.1	23	50	0.091	1326	1326	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	10.30	28.9	17.7	0.10	0.59	1339	1339	1.3	25	2.3	0.50	20.24	2.4	FALSE	0.5	20.2	2.4	2.2	22	50	0.091	1339	1339	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	10.50	28.7	17.8	0.10	0.58	1365	1365	1.2	25	2.3	0.50	20.14	2.4	FALSE	0.5	20.1	2.4	2.2	22	49	0.091	1365	1365	0.98	0.17	1.00	1.19	0.65	Yes	No	No
	10.70	28.5	18.4	0.10	0.56	1391	1391	1.2	25	2.3	0.50	20.64	2.4	FALSE	0.5	20.6	2.4	2.2	23	49	0.091	1391	1391	0.98	0.17	1.00	1.19	0.65	Yes	No	No
	10.80	28.4	20.4	0.10	0.51	1404	1404	1.2	28	2.2	0.50	22.86	2.3	FALSE	0.5	22.9	2.3	2.0	25	49	0.091	1404	1404	0.97	0.17	1.00	1.19	0.65	Yes	No	No
	11.00	28.2	21.0	0.10	0.49	1430	1430	1.2	28	2.2	0.50	23.32	2.3	FALSE	0.5	23.3	2.3	1.9	26	49	0.091	1430	1430	0.97	0.17	1.00	1.19	0.65	Yes	No	No
	11.20	28.0	22.4	0.20	0.92	1456	1456	1.2	30	2.3	0.50	24.69	2.4	FALSE	0.5	24.7	2.4	2.3	27	62	0.102	1456	1456	0.97	0.17	1.00	1.19	0.73	Yes	No	No
	11.30	27.9	23.2	0.20	0.89	1469	1469	1.2	31	2.3	0.50	25.48	2.4	FALSE	0.5	25.5	2.4	2.2	28	61	0.101	1469	1469	0.97	0.17	1.00	1.19	0.73	Yes	No	No
	11.50	27.7	24.8	0.30	1.25	1495	1495	1.2	32	2.4	0.50	27.05	2.4	FALSE	0.5	27.0	2.4	2.4	30	71	0.114	1495	1495	0.97	0.17	1.00	1.19	0.82	Yes	No	No
	11.60	27.6	26.4	0.30	1.17	1508	1508	1.2	34	2.3	0.50	28.71	2.4	FALSE	0.5	28.7	2.4	2.3	31	71	0.113	1508	1508	0.97	0.17	1.00	1.19	0.81	Yes	No	No
	11.80	27.4	26.5	0.20	0.78	1534	1534	1.2	34	2.2	0.50	28.57	2.3	FALSE	0.5	28.6	2.3	1.9	31	61	0.101	1534	1534	0.97	0.17	1.00	1.19	0.73	Yes	No	No
	12.00	27.2	26.8	0.20	0.77	1560	1560	1.2	33	2.2	0.50	28.64	2.3	FALSE	0.5	28.6	2.3	1.9	31	60	0.101	1560	1560	0.97	0.17	1.00	1.19	0.72	Yes	No	No
	12.10	27.1	28.6	0.20	0.72	1573	1573	1.2	35	2.2	0.50	30.49	2.3	FALSE	0.5	30.5	2.3	1.8	33	60	0.101	1573	1573	0.97	0.17	1.00	1.19	0.72	Yes	No	No
	12.30	26.9	33.0	0.20	0.62	1599	1599	1.2	40	2.1	0.50	35.01	2.2	FALSE	0.5	35.0	2.2	1.6	38	61	0.101	1599	1599	0.97	0.17	1.00	1.19	0.73	Yes	No	No
	12.50	26.7	35.6	0.20	0.57	1625	1625	1.1	43	2.1	0.50	37.52	2.1	FALSE	0.5	37.5	2.1	1.5	41	62	0.102	1625	1625	0.97	0.17	1.00	1.19	0.73	Yes	No	No
	12.60	26.6	34.3	0.10	0.30	1638	1638	1.1	41	2.0	0.50	35.97	2.0	FALSE	0.5	36.0	2.0	1.4	39	53	0.094	1638	1638	0.97	0.17	1.00	1.19	0.68	Yes	No	No
	12.80	26.4	37.0	0.20	0.55	1664	1664	1.1	43	2.1	0.50	38.55	2.1	FALSE	0.5	38.5	2.1	1.5	42	62	0.102	1664	1664	0.97	0.17	1.00	1.19	0.74	Yes	No	No
	13.00	26.2	38.0	0.20	0.54	1690	1690	1.1	44	2.1	0.50	39.30	2.1	FALSE	0.5	39.3	2.1	1.5	43	62	0.102	1690	1690	0.97	0.17	1.00	1.19	0.74	Yes	No	No
	13.10	26.1	37.3	0.20	0.55	1703	1703	1.1	43	2.1	0.50	38.40	2.1	FALSE	0.5	38.4	2.1	1.5	42	62	0.102	1703	1703	0.97	0.17	1.00	1.19	0.74	Yes	No	No
	13.30	25.9	34.1	0.30	0.90	1729	1729	1.1	38	2.2	0.50	34.75	2.3	FALSE	0.5	34.8	2.3	1.8	38	69	0.110	1729	1729	0.97	0.17	1.00	1.19	0.80	Yes	No	No
	13.50	25.7	38.1	0.20	0.54	1755	1755	1.1	42	2.1	0.50	38.63	2.1	FALSE	0.5	38.6	2.1	1.5	42	62	0.102	1755	1755	0.97	0.16	1.00	1.19	0.74	Yes	No	No
	13.60	25.6	44.4	0.20	0.46	1768	1768	1.1	49	2.0	0.50	45.00	2.0	FALSE	0.5	45.0	2.0	1.3	49	64	0.105	1768	1768	0.97	0.16	1.00	1.19	0.76	Yes	No	No
	13.80	25.4	43.8	0.40	0.93	1794	1794	1.1	48	2.1	0.50	44.04	2.2	FALSE	0.5	44.0	2.2	1.6	48	77	0.122	1794	1794	0.97	0.16	1.00	1.19	0.89	Yes	No	No
	13.90	25.3	46.3	0.30	0.66	1807	1807	1.1	50	2.1	0.50	46.43	2.1	FALSE	0.5	46.4	2.1	1.4	50	71	0.114	1807	1807	0.97	0.16	1.00	1.19	0.82	Yes	No	No
	14.10	25.1	51.6	0.40	0.79	1833	1833	1.1	55	2.1	0.50	51.47	2.1	FALSE	0.5	51.5	2.1	1.4	55	79	0.126	1833	1833	0.97	0.16	1.00	1.19	0.91	Yes	No	No
	14.30	24.9	49.7	0.40	0.82	1859	1859	1.1	52	2.1	0.50	49.18	2.1	FALSE	0.5	49.2	2.1	1.5	53	78	0.124	1859	1859	0.97	0.16	1.00	1.19	0.90	Yes	No	No
	14.40	24.8	42.4	0.30	0.72	1872	1872	1.1	44	2.1	0.50	41.67	2.1	FALSE	0.5	41.7	2.1	1.5	45	69	0.111	1872	1872	0.97	0.16	1.00	1.19	0.80	Yes	No	No
	14.60	24.6	37.0	0.30	0.83	1898	1898	1.1	38	2.2	0.50	35.98	2.2	FALSE	0.5	36.0	2.2	1.7	39	68	0.109	1898	1898	0.97	0.16	1.00	1.19	0.79	Yes	No	No
	14.80	24.4	35.3	0.40	1.16	1924	1924	1.0	36	2.3	0.50	34.04	2.3	FALSE	0.5	34.0	2.3	2.0	37	75	0.120	1924	1924	0.97	0.16	1.00	1.19	0.87	Yes	No	No
	14.90	24.3	37.9	0.40	1.08	1937	1937	1.0	38	2.3	0.50	36.48	2.3	FALSE	0.5	36.5	2.3	1.9	40	75	0.119	1937	1937	0.97	0.16	1.00	1.19	0.87	Yes	No	No
	15.10	24.1	36.8	0.40	1.12	1963	1963	1.0	36	2.3	0.50	35.15	2.3	FALSE	0.5	35.1	2.3	2.0	38	75	0.119	1963	1963	0.96	0.16	1.00	1.19	0.87	Yes	No	No
	15.30	23.9	34.5	0.30	0.90	1989	1989	1.0	34	2.3	0.50	32.66	2.3	FALSE	0.5	32.7	2.3	1.9	36	67	0.108	1989	1989	0.96	0.16	1.00	1.19	0.79	Yes	No	No
	15.40	23.8	31.6	0.30	0.98	2002	2002	1.0	31	2.3	0.50	29.73	2.3	FALSE	0.5	29.7	2.3	2.1	32	67	0.108	2002	2002	0.96	0.16	1.00	1.19	0.79	Yes	No	No
WM0004_015C	15.60	23.6	31.7	0.30	0.98	2028	2028	1.0	30	2.3	0.50	29.63	2.3	FALSE	0.5	29.6	2.3	2.1	32	67	0.108	2028	2028	0.96	0.16	1.00	1.19	0.79	Yes	No	No
	15.70	23.5	34.2	0.20	0.60	2041	2041	1.0	33	2.2	0.50	31.93	2.2	FALSE	0.5	31.9	2.2	1.7	35	59	0.099	2041	2041	0.96	0.16	1.00	1.19	0.72	Yes	No	No
	15.90	23.3	33.2	0.30	0.93	2067	2067	1.0	31	2.3	0.50	30.76	2.3	FALSE	0.5	30.8	2.3	2.0	34	67	0.108	2067	2067	0.96	0.16	1.00	1.19	0.78	Yes	No	No
	16.10	23.1	28.3	0.20	0.73	2093	2093	1.0	26	2.3	0.50	25.90	2.3	FALSE	0.5	25.9	2.3	2.0	28	58	0.098	2093	2093	0.96	0.16	1.00	1.19	0.71	Yes	No	No
	16.20	23.0	25.2	0.30	1.24	2106	2106	1.0	23	2.5	0.50	22.88	2.5	FALSE	0.5	22.9	2.5	2.7	25	68	0.110	2106	2106	0.96	0.16	1.00	1.19	0.80	Yes	No	No
	16.40	22.8	23.3	0.30	1.35	2132	2132	1.0	21	2.5	0.50	20.94	2.5	FALSE	0.5	20.9	2.5	3.0	23	69	0.110	2132	2132	0.96	0.16	1.00	1.19	0.80	Yes	No	No
	16.60	22.6	22.9	0.30	1.37	2158	2158	1.0	20	2.6	0.50	20.42	2.6	FALSE	0.5	20.4	2.6	3.0	23	69	0.111	2158	2158	0.96	0.16	1.00	1.19	0.80	Yes	No	No
	16.70	22.5	21.9	0.30	1.44	2171	2171	1.0	19	2.6	0.50	19.42	2.6	FALSE	0.5	19.4	2.6	3.2	22	69	0.111	2171	2171	0.96	0.16	0.99	1.19	0.80	Yes	No	No
	16.90	22.3	22.4	0.20	0.94	2197	2197	1.0	19	2.5	0.50	19.76	2.5	FALSE	0.5	19.8	2.5	2.7	22	59	0.099	2197	2197	0.96	0.16	0.99	1.19	0.71	Yes	No	No
	17.10	22.1	19.2	0.20	1.11	2223	2223	1.0	16	2.6	0.50	16.68	2.6	FALSE	0.5	16.7	2.6	3.2	19	60	0.100	2223	2223	0.96	0.16	0.99	1.19	0.72	Yes	No	No
	17.20	22.0	19.9	0.20	1.06	2236	2236	1.0	17	2.6	0.50	17.27	2.6	FALSE	0.5	17.3	2.6	3.1	19	60	0.100	2236	2236	0.96	0.16	0.99	1.19	0.72	Yes	No	No
	17.40	21.8	22.4	0.20	0.94	2262	2262	1.0	19	2.5	0.50	19.44	2.5	FALSE	0.5	19.4	2.5	2.7	22	58	0.099	2262	2262	0.96	0.16	0.98	1.19	0.71	Yes	No	No
	17.60	21.6	24.9	0.20	0.84	2288	2288	1.0	21	2.4	0.50	21.59	2.4	FALSE	0.5	21.6	2.4	2.4	24	58	0.098	2288	2288	0.96	0.16	0.98	1.19	0.70	Yes	No	No
	17.70	21.5	30.8	0.20	0.67	2301	2301	1.0	26	2.3	0.50	26.87	2.3	FALSE	0.5	26.9	2.3	1.9	30	57	0.097	2301	2301	0.96	0.16	0.98	1.19	0.70	Yes	No	No
	17.90	21.3	34.2	0.20	0.61	2327	2327	1.0	28	2.3	0.50	29.78	2.2	FALSE	0.5	29.8	2.2	1.8	33	57	0.097	2327	2327	0.96	0.16	0.98	1.19	0.69	Yes	No	No
	18.00	21.2	35.7	0.20	0.58	2340	2340	1.0	30	2.2	0.50	31.04	2.2	FALSE	0.5	31.0	2.2	1.7	34	57	0.098	2340	2340	0.96	0.16	0.98	1.19	0.70	Yes	No	No
	18.20	21.0	41.2	0.30	0.75	2366	2366	0.9	34	2.2	0.50	35.77	2.2	FALSE	0.5	35.8	2.2	1.7	39	66	0.106	2366	2366	0.96	0.16	0.97	1.19	0.76	Yes	No	No
	18.40	20.8	45.6	0.40	0.90	2392	2392	0.9	37	2.2	0.50	39.47	2.2	FALSE	0.5	39.5	2.2	1.7	43	73	0.116	2392	2392	0.96	0.16	0.97	1.19	0.82	Yes	No	No

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{vd} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																											Kσ	MSF				
	18.50	20.7	51.9	0.40	0.79	2405	2405	0.9	42	2.2	0.50	44.95	2.1	FALSE	0.5	44.9	2.1	1.5	49	74	0.118	2405	2405	0.96	0.16	0.97	1.19	0.83	Yes	No	No
	18.70	20.5	53.5	0.50	0.96	2431	2431	0.9	43	2.2	0.50	46.11	2.2	FALSE	0.5	46.1	2.2	1.6	50	80	0.127	2431	2431	0.96	0.16	0.97	1.19	0.90	Yes	No	No
	18.90	20.3	52.6	0.50	0.97	2457	2457	0.9	42	2.2	0.50	45.06	2.2	FALSE	0.5	45.1	2.2	1.6	49	79	0.126	2457	2457	0.96	0.16	0.96	1.19	0.89	Yes	No	No
	19.00	20.2	49.6	0.40	0.83	2470	2470	0.9	39	2.2	0.50	42.31	2.2	FALSE	0.5	42.3	2.2	1.6	46	73	0.116	2470	2470	0.96	0.16	0.96	1.19	0.82	Yes	No	No
	19.20	20.0	48.1	0.30	0.64	2496	2496	0.9	38	2.2	0.50	40.77	2.1	FALSE	0.5	40.8	2.1	1.5	44	66	0.107	2496	2496	0.96	0.16	0.96	1.19	0.75	Yes	No	No
	19.40	19.8	45.2	0.30	0.68	2522	2522	0.9	35	2.2	0.50	38.04	2.2	FALSE	0.5	38.0	2.2	1.6	41	66	0.106	2520	2510	0.95	0.16	0.96	1.19	0.74	Yes	Yes	Yes
	19.50	19.7	43.8	0.40	0.94	2535	2535	0.9	34	2.3	0.50	36.73	2.2	FALSE	0.5	36.7	2.2	1.8	40	72	0.114	2532	2516	0.95	0.16	0.96	1.19	0.80	Yes	Yes	Yes
	19.70	19.5	41.9	0.50	1.23	2561	2561	0.9	32	2.4	0.50	34.90	2.3	FALSE	0.5	34.9	2.3	2.1	38	78	0.124	2556	2530	0.95	0.16	0.95	1.19	0.86	Yes	Yes	Yes
	19.80	19.4	40.2	0.50	1.28	2574	2574	0.9	30	2.4	0.50	33.35	2.4	FALSE	0.5	33.3	2.4	2.1	36	78	0.125	2568	2537	0.95	0.16	0.95	1.19	0.86	Yes	Yes	Yes
	20.00	19.2	36.8	0.40	1.13	2600	2600	0.9	27	2.4	0.50	30.27	2.4	FALSE	0.5	30.3	2.4	2.2	33	72	0.114	2592	2550	0.95	0.17	0.95	1.19	0.78	Yes	Yes	Yes
	20.20	19.0	32.9	0.30	0.95	2626	2626	0.9	24	2.4	0.50	26.80	2.4	FALSE	0.5	26.8	2.4	2.2	30	64	0.105	2616	2564	0.95	0.17	0.95	1.19	0.72	Yes	Yes	Yes
	20.30	18.9	35.4	0.30	0.88	2639	2639	0.9	26	2.4	0.50	28.84	2.3	FALSE	0.5	28.8	2.3	2.0	32	64	0.105	2628	2570	0.95	0.17	0.95	1.19	0.71	Yes	Yes	Yes
	20.50	18.7	37.9	0.30	0.82	2665	2665	0.9	27	2.3	0.50	30.80	2.3	FALSE	0.5	30.8	2.3	1.9	34	64	0.104	2652	2584	0.95	0.17	0.94	1.19	0.71	Yes	Yes	Yes
	20.70	18.5	38.3	0.30	0.81	2691	2691	0.9	27	2.3	0.50	30.97	2.3	FALSE	0.5	31.0	2.3	1.9	34	64	0.104	2676	2597	0.95	0.17	0.94	1.19	0.70	Yes	Yes	Yes
	20.80	18.4	36.4	0.40	1.14	2704	2704	0.9	26	2.4	0.50	29.30	2.4	FALSE	0.5	29.3	2.4	2.2	32	71	0.114	2688	2604	0.95	0.17	0.94	1.19	0.76	Yes	Yes	Yes
	21.00	18.2	30.7	0.50	1.70	2730	2730	0.9	21	2.6	0.50	24.41	2.5	FALSE	0.5	24.4	2.5	3.0	27	80	0.128	2712	2618	0.95	0.17	0.94	1.19	0.85	Yes	Yes	Yes
	21.20	18.0	26.2	0.50	2.01	2756	2756	0.8	18	2.7	1.00	18.01	2.7	FALSE	1.0	18.0	2.7	3.9	20	79		2736	2631	0.95	0.17	0.94	1.19	100.00	No	Yes	No
	21.30	17.9	26.2	0.40	1.61	2769	2769	0.8	18	2.6	1.00	17.92	2.6	FALSE	1.0	17.9	2.6	3.6	20	71		2748	2638	0.95	0.17	0.93	1.19	100.00	No	Yes	No
	21.50	17.7	28.7	0.30	1.10	2795	2795	0.9	20	2.5	0.50	22.45	2.5	FALSE	0.5	22.5	2.5	2.6	25	65	0.105	2772	2651	0.95	0.17	0.93	1.19	0.69	Yes	Yes	Yes
	21.70	17.5	33.5	0.30	0.93	2821	2821	0.9	23	2.4	0.50	26.27	2.4	FALSE	0.5	26.3	2.4	2.2	29	64	0.104	2796	2665	0.95	0.17	0.93	1.19	0.68	Yes	Yes	Yes
	21.80	17.4	36.6	0.30	0.85	2834	2834	0.9	25	2.4	0.50	28.73	2.3	FALSE	0.5	28.7	2.3	2.0	32	63	0.104	2808	2672	0.95	0.17	0.93	1.19	0.68	Yes	Yes	Yes
	22.00	17.2	33.5	0.50	1.56	2860	2860	0.9	22	2.5	0.50	26.07	2.5	FALSE	0.5	26.1	2.5	2.7	29	79	0.125	2832	2685	0.95	0.17	0.93	1.19	0.81	Yes	Yes	Yes
	22.10	17.1	25.4	0.40	1.67	2873	2873	0.7	17	2.7	1.00	16.68	2.7	FALSE	1.0	16.7	2.7	3.8	19	71		2844	2692	0.95	0.17	0.93	1.19	100.00	No	Yes	No
	22.30	16.9	22.5	0.40	1.90	2899	2899	0.7	15	2.8	1.00	14.52	2.8	FALSE	1.0	14.5	2.8	4.4	16	72		2868	2706	0.95	0.17	0.92	1.19	100.00	No	Yes	No
	22.50	16.7	34.8	0.30	0.90	2925	2925	0.9	23	2.4	0.50	26.80	2.4	FALSE	0.5	26.8	2.4	2.1	30	63	0.104	2892	2719	0.95	0.17	0.92	1.19	0.66	Yes	Yes	Yes
	22.60	16.6	42.3	0.30	0.73	2938	2938	0.8	28	2.3	0.50	32.75	2.2	FALSE	0.5	32.8	2.2	1.8	36	63	0.103	2904	2726	0.95	0.17	0.92	1.19	0.66	Yes	Yes	Yes
	22.80	16.4	49.1	0.30	0.63	2964	2964	0.8	32	2.2	0.50	38.03	2.1	FALSE	0.5	38.0	2.1	1.5	41	64	0.105	2928	2739	0.95	0.17	0.92	1.19	0.67	Yes	Yes	Yes
	23.00	16.2	50.5	0.30	0.61	2990	2990	0.8	33	2.2	0.50	38.97	2.1	FALSE	0.5	39.0	2.1	1.5	42	64	0.105	2952	2753	0.95	0.17	0.92	1.19	0.66	Yes	Yes	Yes
	23.10	16.1	50.2	0.40	0.82	3003	3003	0.8	32	2.3	0.50	38.64	2.2	FALSE	0.5	38.6	2.2	1.7	42	70	0.112	2964	2760	0.95	0.17	0.92	1.19	0.71	Yes	Yes	Yes
	23.30	15.9	50.2	0.40	0.82	3029	3029	0.8	32	2.3	0.50	38.46	2.2	FALSE	0.5	38.5	2.2	1.7	42	70	0.112	2988	2773	0.95	0.17	0.91	1.19	0.70	Yes	Yes	Yes
	23.50	15.7	46.2	0.30	0.67	3055	3055	0.8	29	2.3	0.50	35.14	2.2	FALSE	0.5	35.1	2.2	1.6	38	63	0.103	3012	2787	0.95	0.17	0.91	1.19	0.65	Yes	Yes	Yes
	23.60	15.6	42.7	0.30	0.73	3068	3068	0.8	27	2.3	0.50	32.31	2.2	FALSE	0.5	32.3	2.2	1.8	35	63	0.103	3024	2793	0.94	0.17	0.91	1.19	0.64	Yes	Yes	Yes
	23.80	15.4	40.4	0.30	0.77	3094	3094	0.8	25	2.3	0.50	30.37	2.3	FALSE	0.5	30.4	2.3	1.9	33	63	0.103	3048	2807	0.94	0.17	0.91	1.19	0.64	Yes	Yes	Yes
	24.00	15.2	40.5	0.30	0.77	3120	3120	0.8	25	2.3	0.50	30.31	2.3	FALSE	0.5	30.3	2.3	1.9	33	62	0.103	3072	2820	0.94	0.18	0.91	1.19	0.63	Yes	Yes	Yes
	24.10	15.1	36.6	0.30	0.86	3133	3133	0.8	22	2.4	0.50	27.21	2.3	FALSE	0.5	27.2	2.3	2.1	30	63	0.103	3084	2827	0.94	0.18	0.91	1.19	0.63	Yes	Yes	Yes
	24.30	14.9	31.8	0.50	1.65	3159	3159	0.7	19	2.6	1.00	19.13	2.6	FALSE	1.0	19.1	2.6	3.4	21	73		3108	2841	0.94	0.18	0.90	1.19	100.00	No	Yes	No
	24.40	14.8	26.2	0.60	2.44	3172	3172	0.7	16	2.8	1.00	15.52	2.8	FALSE	1.0	15.5	2.8	4.7	17	82		3120	2848	0.94	0.18	0.90	1.19	100.00	No	Yes	No
	24.60	14.6	27.9	0.50	1.90	3198	3198	0.7	16	2.7	1.00	16.45	2.7	FALSE	1.0	16.4	2.7	4.0	18	75		3144	2861	0.94	0.18	0.90	1.19	100.00	No	Yes	No
	24.80	14.4	35.3	0.50	1.48	3224	3224	0.8	21	2.6	0.50	25.80	2.5	FALSE	0.5	25.8	2.5	2.7	29	77	0.122	3168	2875	0.94	0.18	0.90	1.19	0.74	Yes	Yes	Yes
	24.90	14.3	39.9	0.40	1.04	3237	3237	0.8	24	2.4	0.50	29.25	2.4	FALSE	0.5	29.3	2.4	2.1	32	69	0.111	3180	2881	0.94	0.18	0.90	1.19	0.67	Yes	Yes	Yes
	25.10	14.1	39.1	0.30	0.80	3263	3263	0.8	23	2.4	0.50	28.52	2.3	FALSE	0.5	28.5	2.3	2.0	31	62	0.102	3204	2895	0.94	0.18	0.90	1.19	0.62	Yes	Yes	Yes
	25.30	13.9	35.3	0.30	0.89	3289	3289	0.8	20	2.5	0.50	25.52	2.4	FALSE	0.5	25.5	2.4	2.2	28	62	0.103	3228	2908	0.94	0.18	0.90	1.19	0.62	Yes	Yes	Yes
	25.40	13.8	31.7	0.20	0.67	3302	3302	0.8	18	2.4	0.50	22.74	2.4	FALSE	0.5	22.7	2.4	2.1	25	54	0.095	3240	2915	0.94	0.18	0.89	1.19	0.57	Yes	Yes	Yes
	25.60	13.6	28.6	0.20	0.74	3328	3328	0.8	16	2.5	0.50	20.30	2.4	FALSE	0.5	20.3	2.4	2.4	23	55	0.095	3264	2929	0.94	0.18	0.89	1.19	0.57	Yes	Yes	Yes
	25.80	13.4	30.1	0.20	0.70	3354	3354	0.8	17	2.5	0.50	21.34	2.4	FALSE	0.5	21.3	2.4	2.3	24	55	0.095	3288	2942	0.94	0.18	0.89	1.19	0.57	Yes	Yes	Yes
	25.90	13.3	28.0	0.20	0.76	3367	3367	0.8	16	2.5	0.50	19.72	2.4	FALSE	0.5	19.7	2.4	2.5	22	55	0.095	3300	2949	0.94	0.18	0.89	1.19	0.57	Yes	Yes	Yes
	26.10	13.1	28.6	0.30	1.12	3393	3393	0.8	16	2.6	0.50	20.08	2.5	FALSE	0.5	20.1	2.5	2.8	23	64	0.104	3324	2962	0.94	0.18	0.89	1.19	0.61	Yes	Yes	Yes
	26.20	13.0	28.0	0.30	1.14	3406	3406	0.6	15	2.6	1.00	15.44	2.6	FALSE	1.0	15.4	2.6	3.4	17	59		3336	2969	0.94	0.18	0.89	1.19	100.00	No	Yes	No
	26.40	12.8	27.9	0.30	1.15	3432	3432	0.6	15	2.6	1.00	15.26	2.6	FALSE	1.0	15.3	2.6	3.5	17	59		3360	2983	0.94	0.18	0.89	1.19	100.00	No	Yes	No
	26.60	12.6	27.1	0.40	1.58	3458	3458	0.6	15	2.7	1.00	14.67	2.7	FALSE	1.0	14.7	2.7	4.0	17	67		3384	2996	0.94	0.18	0.88	1.19	100.00	No	Yes	No
	26.70	12.5	24.9	0.50	2.16	3471	3471	0.6	13	2.8	1.00	13.35	2.8	FALSE	1.0	13.3	2.8	4.9	15	74		3396	3003	0.94	0.18	0.88	1.19	100.00	No	Yes	No
	26.90	12.3	21.8	0.60	2.99	3497	3497	0.6	11	2.9	1.00	11.47	2.9	FALSE	1.0	11.5	2.9	6.2	13	81		3420	3017	0.94	0.18	0.88	1.19	100.00	No	Yes	No
	27.10	12.1	19.8	0.50	2.77	3523	3523	0.6	10	3.0	1.00	10.24	3.0	FALSE	1.0	10.2	3.0	6.4	12	76		3444	3030	0.94	0.18	0.88	1.19	100.00	No	Yes	No
	27.20	12.0	21.4	0.60	3.06	3536	3536	0.6	11	3.0	1.00	11.10	3.0	FALSE	1.0	11.1	3.0	6.4	13	81		3456	3037	0.94	0.18	0.88	1.19	100.00	No	Yes	No
	27.40	11.8	19.3	0.50	2.85	3562	3562	0.6	10	3.0	1.00	9.84	3.0	FALSE	1.0	9.8	3.0	6.6	11	76		3480	3050	0.94	0.18	0.88	1.19	100.00	No	Yes	No
	27.60	11.6	20.3	0.50	2.70	3588	3588	0.6	10	3.0	1.00	10.32	3.0	FALSE	1.0	10.3	3.0	6.3	12	76		3504	3064	0.94	0.18	0.88	1.19	100.00	No	Yes	No
	27.70	11.5	26.9	0.40	1.59	3601	3601	0.6	14	2.7	1.00	13.94	2.7	FALSE	1.0	13.9	2.7	4.2	16	66		3516	3071	0.94	0.18	0.88	1.19	100.00	No	Yes	No
	27.90	11.3	27.8	0.60	2.31	3627	3627	0.6	14	2.8	1.00	14.33	2.8	FALSE	1.0	14.3	2.8	4.8	16	78		3540	3084	0.93	0.18	0.87	1.19	100.00	No	Yes	No
	28.10	11.1	23.1	0.50	2.35	3653	3653	0.6	12	2.9	1.00	11.65	2.9	FALSE	1.0	11.6	2.9	5.5	13	74		3564	3098	0.93	0.18	0.87	1.19	100.00	No	Yes	No
	28.20	11.0	22.1	0.50	2.47	3666	3666	0.6	11	2.9	1.00	11.06	2.9	FALSE	1.0	11.1	2.9	5.8	13	74		3576	3104	0.93	0.18	0.87	1.19	100.00	No	Yes	No
	28.40	10.8	21.2	0.60	3.10	3692	3692	0.6	10	3.0	1.00	10.48	3.0	FALSE	1.0	10.5	3.0	6.6	12	80		3600	3118	0.93	0.18	0.87	1.19	100.00	No	Yes	No
	28.50	10.7	15.0	0.50	3.80	3705	3705	0.6	7	3.2	1.00	7.10	3.2	FALSE	1.0	7.1	3.2	8.9	9	77		3612	3125	0.93	0.18	0.87	1.19	100.00	No	Yes	No
	28.70	10.5	12.2	0.40	3.87	3731	3731	0.6	6	3.3	1.00	5.54	3.3	FALSE	1.0	5.5	3.3	10.3	7	71		3636	3138	0.93	0.18	0.87	1.19	100.00	No	Yes	No
	28.90	10.3	10.5	0.10	1.16	3757	3757	0.6	5	3.1	1.00	4.59	3.1	FALSE	1.0	4.6	3.1	7.8	6	46		3660	3152	0.93	0.18	0.87	1.19	100.00	No	Yes	No
	29.00	10.2	9.3	0.10	1.35	3770	3770	0.6	4	3.2	1.00	3.93	3.2	FALSE	1.0	3.9	3.2	8.9	5	47		3672	3158	0.93	0.18	0.87	1.19	100.00	No	Yes	No
	29.20	10.0	9.4	0.20	2.67	3796	3796	0.6	4	3.3	1.00	3.95	3.3	FALSE	1.0	4.0	3.3	10.9	5	57		3696	3172	0.93	0.18	0.86	1.19	100.00	No	Yes	No
	29.40	9.8	11.2	0.30	3.23	3822	3822	0.6	5	3.3	1.00	4.86	3.3	FALSE	1.0	4.9	3.3	10.4	6	64		3720	3186	0.93	0.19	0.86	1.19	100.00	No	Yes	No
	29.50	9.7	15.1	0.30	2.28	3835	3835	0.6	7	3.1	1.00	6.87	3.1	FALSE	1.0	6.9	3.1	7.5	8	63		3732	3192	0.93	0.19	0.86	1.19	100.00	No	Yes	No
	29.70	9.5	17.7	0.30	1.90	3861	3861	0.5	8	3.0	1.00	8.17	3.0	FALSE	1.0	8.2	3.0	6.4	10	62		3756	3206	0.93	0.19	0.86	1.19	100.00	No	Yes	No
	29.90	9.3	15.3	0.30	2.25	3887	3887	0.5	7	3.1	1.00	6.87	3.1	FALSE	1.0	6.9	3.1	7.5	8	63		3780	3219	0.93	0.19	0.86	1.19	100.00	No	Yes	No
	30.00	9.2	16.1	0.40	2.83	3900	3900	0.5	7	3.1	1.00	7.26	3.1	FALSE	1.0	7.3	3.1	7.9	9	69		3792	3226	0.93	0.19	0.86	1.19	100.00	No	Yes	No
	30.20	9.0	13.8	0.30	2.53	3926	3926	0.5	6	3.1	1.00	6.03	3.1	FALSE	1.0	6.0	3.1	8.5	7	63		3816	3240	0.93	0.19	0.86	1.19	100.00	No	Yes	No
	30.30	8.9	11.6	0.30	3.12	3939	3939	0.5	5	3.3	1.00	4.89	3.3	FALSE	1.0	4.9	3.3	10.2	6	64		3828	3246	0.93	0.19	0.86	1.19	100.00	No	Yes	No
	30.50	8.7	10.6	0.30	3.48	3965	3965	0.5	4	3.3	1.00	4.35	3.3	FALSE	1.0	4.3	3.3	11.3	6	64		3852	3260	0.93	0.19	0.85	1.19	100.00	No	Yes	No
	30.70	8.5	15.2	0.40	3.03	3991	3991	0.5	7	3.1	1.00	6.62	3.1	FALSE	1.0	6.6	3.1	8.6	8	69		3876	3273	0.92	0.19	0.85	1.19	100.00	No	Yes	No
	30.80	8.4	22.9	0.50	2.39	4004	4004	0.5	10	2.9	1.00	10.44	2.9	FALSE	1.0	10.4	2.9	6.0	12	72		3888	3280	0.92	0.19	0.85	1.19	100.00	No	Yes	No
	31.00	8.2	21.3	0.50	2.59	4028	4016	0.5	10	3.0	1.00	9.61	3.0	FALSE	1.0	9.6	3.0	6.5	11	73		3912	3292	0.92	0.19	0.85	1.19	100.00	No	Yes	No
	31.20	8.0	18.2	0.60	3.71	4052	4027	0.5	8	3.1	1.00	8.03	3.1	FALSE	1.0	8.0	3.1	8.3	10	79		3936	3303	0.92	0.19	0.85	1.19	100.00	No	Yes	No
	31.30	7.9	19.5	0.60	3.43	4064	4033	0.5	9	3.1	1.00	8.66	3.1	FALSE	1.0	8.7	3.1	7.7	10	79		3948	3309	0.92	0.19	0.85	1.19	100.00	No	Yes	No
	31.50	7.7	25.2	0.60	2.59	4088	4044	0.5	11	2.9	1.00	11.45	2.9	FALSE	1.0	11.5	2.9	5.8	13	77		3972	3320	0.92	0.19	0.85	1.19	100.00	No	Yes	No
	31.70	7.5	28.5	0.50	1.89	4112	4056	0.5	13	2.8	1.00	13.04	2.8	FALSE	1.0	13.0	2.8	4.7	15	70		3996	3332	0.92	0.19	0.85	1.19	100.00	No	Yes	No
	31.80	7.4	25.6	0.60	2.55	4124	4062	0.5	12	2.9	1.00	11.59	2.9	FALSE	1.0	11.6	2.9	5.7	13	77		4008	3338	0.92	0.19	0.85	1.19	100.00	No	Yes	No
	32.00	7.2	20.5	0.50	2.71	4148	4073	0.5	9	3.0	1.00	9.05	3.0	FALSE	1.0	9.0	3.0	6.8	11	73		4032	3349	0.91	0.19	0.85	1.19	100.00	No	Yes	No
	32.20	7.0	16.4	0.50	3.49	4172	4085	0.5	7	3.2	1.00	7.01	3.2	FALSE	1.0	7.0	3.2	8.7	8	74		4056	3361	0.91	0.19	0.85	1.19	100.00	No	Yes	No
	32.30	6.9	13.3	0.30	2.68	4184	4090	0.5	5	3.2	1.00	5.48	3.2	FALSE	1.0	5.5	3.2	9.1	7	63		4068	3367	0.91	0.19	0.85	1.19	100.00	No	Yes	No
	32.50	6.7	18.9	0.50	2.98	4208	4102	0.5	8	3.1	1.00	8.19	3.1	FALSE	1.0	8.2	3.1	7.5	10	73		4092	3378	0.91	0.19	0.85	1.19	100.00	No	Yes	No
	32.60	6.6	20.4	0.60	3.28	4220	4108	0.5	9	3.1	1.00	8.91	3.1	FALSE	1.0	8.9	3.1	7.4	11	78		4104	3384	0.91	0.19	0.85	1.19	100.00	No	Yes	No
	32.80	6.4	20.7	0.60	3.23	4244	4119	0.5	9	3.1	1.00	9.02	3.1	FALSE	1.0	9.0	3.1	7.3	11	78		4128	3395	0.91	0.19	0.85	1.19	100.00	No	Yes	No
	33.00	6.2	17.1	0.50	3.34	4268	4131	0.5	7	3.1	1.00	7.25	3.1	FALSE	1.0	7.2	3.1	8.4	9	74		4152	3407	0.91	0.19	0.85	1.19	100.00	No	Yes	No
	33.10	6.1	11.7	0.30	3.14	4280	4136	0.5	5	3.3	1.00	4.62	3.3	FALSE	1.0	4.6	3.3	10.5	6	63		4164	3413	0.90	0.19	0.85	1.19	100.00	No	Yes	No
	33.30	5.9	10.7	0.20	2.34	4304	4148	0.5	4	3.3	1.00	4.12	3.3	FALSE	1.0	4.1	3.3	10.2	5	56		4188	3424	0.90	0.19	0.85	1.19	100.00	No	Yes	No
	33.50	5.7	9.8	0.20	2.62	4328	4160	0.5	4	3.3	1.00	3.67	3.3	FALSE	1.0	3.7	3.3	11.3	5	56		4212	3436	0.90	0.19	0.84	1.19	100.00	No	Yes	No

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{vd} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
	33.60	5.6	14.1	0.40	3.35	4340	4165	0.5	6	3.2	1.00	5.73	3.2	FALSE	1.0	5.7	3.2	9.6	7	69		4224	3441	0.90	0.19	0.84	1.19	100.00	No	Yes	No
	33.80	5.4	17.5	0.40	2.61	4364	4177	0.5	7	3.1	1.00	7.33	3.1	FALSE	1.0	7.3	3.1	7.6	9	68		4248	3453	0.90	0.19	0.84	1.19	100.00	No	Yes	No
	34.00	5.2	25.3	0.50	2.16	4388	4188	0.5	11	2.9	1.00	11.03	2.9	FALSE	1.0	11.0	2.9	5.5	13	71		4272	3464	0.90	0.19	0.84	1.19	100.00	No	Yes	No
	34.10	5.1	21.0	0.50	2.66	4400	4194	0.5	9	3.0	1.00	8.97	3.0	FALSE	1.0	9.0	3.0	6.8	11	72		4284	3470	0.90	0.19	0.84	1.19	100.00	No	Yes	No
	34.30	4.9	16.8	0.50	3.43	4424	4206	0.5	7	3.2	1.00	6.94	3.2	FALSE	1.0	6.9	3.2	8.7	8	74		4308	3482	0.89	0.19	0.84	1.19	100.00	No	Yes	No
	34.40	4.8	15.0	0.50	3.91	4436	4211	0.5	6	3.2	1.00	6.07	3.2	FALSE	1.0	6.1	3.2	9.8	8	74		4320	3488	0.89	0.19	0.84	1.19	100.00	No	Yes	No
	34.60	4.6	17.8	0.50	3.21	4460	4223	0.5	7	3.1	1.00	7.37	3.1	FALSE	1.0	7.4	3.1	8.2	9	73		4344	3499	0.89	0.19	0.84	1.19	100.00	No	Yes	No
	34.80	4.4	26.6	0.60	2.46	4484	4234	0.5	12	2.9	1.00	11.50	2.9	FALSE	1.0	11.5	2.9	5.7	13	76		4368	3511	0.89	0.19	0.84	1.19	100.00	No	Yes	No
	34.90	4.3	32.9	0.40	1.30	4496	4240	0.5	14	2.7	1.00	14.46	2.7	FALSE	1.0	14.5	2.7	3.8	16	62		4380	3516	0.89	0.19	0.84	1.19	100.00	No	Yes	No
	35.10	4.1	33.1	0.50	1.62	4520	4252	0.5	15	2.7	1.00	14.51	2.7	FALSE	1.0	14.5	2.7	4.1	16	68		4404	3528	0.89	0.19	0.84	1.19	100.00	No	Yes	No
	35.30	3.9	25.4	0.50	2.16	4544	4263	0.5	11	2.9	1.00	10.85	2.9	FALSE	1.0	10.9	2.9	5.6	13	70		4428	3539	0.89	0.19	0.84	1.19	100.00	No	Yes	No
	35.40	3.8	20.8	0.40	2.16	4556	4269	0.5	9	3.0	1.00	8.68	3.0	FALSE	1.0	8.7	3.0	6.4	10	66		4440	3545	0.89	0.19	0.84	1.19	100.00	No	Yes	No
	35.60	3.6	15.7	0.50	3.73	4580	4280	0.5	6	3.2	1.00	6.27	3.2	FALSE	1.0	6.3	3.2	9.5	8	74		4464	3557	0.88	0.19	0.84	1.19	100.00	No	Yes	No
	35.80	3.4	14.3	0.50	4.17	4604	4292	0.5	6	3.3	1.00	5.59	3.3	FALSE	1.0	5.6	3.3	10.5	7	74		4488	3568	0.88	0.19	0.84	1.19	100.00	No	Yes	No
	35.90	3.3	26.1	0.40	1.68	4616	4298	0.5	11	2.8	1.00	11.07	2.8	FALSE	1.0	11.1	2.8	5.0	13	64		4500	3574	0.88	0.19	0.84	1.19	100.00	No	Yes	No
	36.10	3.1	33.5	0.30	0.96	4640	4309	0.5	14	2.6	1.00	14.47	2.6	FALSE	1.0	14.5	2.6	3.4	16	55		4524	3585	0.88	0.19	0.84	1.19	100.00	No	Yes	No
	36.30	2.9	29.9	0.40	1.45	4664	4321	0.5	13	2.7	1.00	12.76	2.7	FALSE	1.0	12.8	2.7	4.3	15	63		4548	3597	0.88	0.19	0.84	1.19	100.00	No	Yes	No
	36.40	2.8	20.8	0.40	2.17	4676	4327	0.5	9	3.0	1.00	8.53	3.0	FALSE	1.0	8.5	3.0	6.5	10	66		4560	3603	0.88	0.19	0.84	1.19	100.00	No	Yes	No
	36.60	2.6	16.4	0.40	2.85	4700	4338	0.5	6	3.1	1.00	6.48	3.1	FALSE	1.0	6.5	3.1	8.5	8	68		4584	3614	0.88	0.19	0.84	1.19	100.00	No	Yes	No
	36.70	2.5	24.9	0.50	2.22	4712	4344	0.5	10	2.9	1.00	10.38	2.9	FALSE	1.0	10.4	2.9	5.8	12	70		4596	3620	0.88	0.19	0.84	1.19	100.00	No	Yes	No
	36.90	2.3	25.0	0.40	1.77	4736	4355	0.5	10	2.9	1.00	10.39	2.9	FALSE	1.0	10.4	2.9	5.3	12	64		4620	3632	0.87	0.19	0.83	1.19	100.00	No	Yes	No
	37.10	2.1	22.0	0.50	2.55	4760	4367	0.5	9	3.0	1.00	8.99	3.0	FALSE	1.0	9.0	3.0	6.7	11	71		4644	3643	0.87	0.19	0.83	1.19	100.00	No	Yes	No
	37.20	2.0	24.9	0.40	1.78	4772	4373	0.5	10	2.9	1.00	10.30	2.9	FALSE	1.0	10.3	2.9	5.3	12	64		4656	3649	0.87	0.19	0.83	1.19	100.00	No	Yes	No
	37.40	1.8	24.8	0.30	1.34	4796	4384	0.5	10	2.8	1.00	10.22	2.8	FALSE	1.0	10.2	2.8	4.8	12	58		4680	3660	0.87	0.19	0.83	1.19	100.00	No	Yes	No
	37.60	1.6	21.0	0.30	1.61	4820	4396	0.5	8	2.9	1.00	8.46	2.9	FALSE	1.0	8.5	2.9	5.9	10	59		4704	3672	0.87	0.19	0.83	1.19	100.00	No	Yes	No
	37.70	1.5	16.2	0.40	2.90	4832	4401	0.5	6	3.2	1.00	6.26	3.2	FALSE	1.0	6.3	3.2	8.7	8	68		4716	3678	0.87	0.19	0.83	1.19	100.00	No	Yes	No
	37.90	1.3	17.3	0.40	2.69	4856	4413	0.5	7	3.1	1.00	6.74	3.1	FALSE	1.0	6.7	3.1	8.1	8	67		4740	3689	0.87	0.19	0.83	1.19	100.00	No	Yes	No
	38.10	1.1	24.9	0.40	1.78	4880	4424	0.5	10	2.9	1.00	10.15	2.9	FALSE	1.0	10.2	2.9	5.4	12	64		4764	3701	0.86	0.19	0.83	1.19	100.00	No	Yes	No
	38.20	1.0	16.1	0.40	2.93	4892	4430	0.5	6	3.2	1.00	6.16	3.2	FALSE	1.0	6.2	3.2	8.8	8	68		4776	3706	0.86	0.19	0.83	1.19	100.00	No	Yes	No
	38.40	0.8	20.1	0.40	2.27	4916	4442	0.5	8	3.0	1.00	7.94	3.0	FALSE	1.0	7.9	3.0	6.9	10	66		4800	3718	0.86	0.19	0.83	1.19	100.00	No	Yes	No
	38.60	0.6	22.6	0.40	1.99	4940	4453	0.5	9	2.9	1.00	9.04	2.9	FALSE	1.0	9.0	2.9	6.1	11	65		4824	3729	0.86	0.19	0.83	1.19	100.00	No	Yes	No
	38.70	0.5	18.4	0.30	1.88	4952	4459	0.5	7	3.0	1.00	7.14	3.0	FALSE	1.0	7.1	3.0	6.9	9	60		4836	3735	0.86	0.19	0.83	1.19	100.00	No	Yes	No
	38.90	0.3	16.8	0.30	2.10	4976	4471	0.5	6	3.1	1.00	6.40	3.1	FALSE	1.0	6.4	3.1	7.6	8	61		4860	3747	0.86	0.19	0.83	1.19	100.00	No	Yes	No
	39.00	0.2	20.0	0.30	1.71	4988	4476	0.5	8	3.0	1.00	7.82	3.0	FALSE	1.0	7.8	3.0	6.3	9	60		4872	3752	0.86	0.19	0.83	1.19	100.00	No	Yes	No
	39.20	0.0	16.6	0.30	2.13	5012	4488	0.5	6	3.1	1.00	6.28	3.1	FALSE	1.0	6.3	3.1	7.8	8	61		4896	3764	0.85	0.19	0.83	1.19	100.00	No	Yes	No
	39.40	-0.2	14.7	0.40	3.28	5036	4499	0.5	5	3.2	1.00	5.41	3.2	FALSE	1.0	5.4	3.2	9.8	7	68		4920	3776	0.85	0.19	0.83	1.19	100.00	No	Yes	No
	39.50	-0.3	30.2	0.30	1.08	5048	4505	0.5	12	2.7	1.00	12.29	2.7	FALSE	1.0	12.3	2.7	3.9	14	56		4932	3781	0.85	0.19	0.83	1.19	100.00	No	Yes	No
	39.70	-0.5	37.5	0.30	0.86	5072	4517	0.7	15	2.6	0.50	22.62	2.4	FALSE	0.5	22.6	2.4	2.4	26	60	0.100	4956	3793	0.85	0.19	0.83	1.19	0.52	Yes	Yes	Yes
	39.90	-0.7	38.8	0.30	0.83	5096	4528	0.7	16	2.5	0.50	23.42	2.4	FALSE	0.5	23.4	2.4	2.3	27	60	0.100	4980	3804	0.85	0.19	0.83	1.19	0.52	Yes	Yes	Yes
	40.00	-0.8	41.7	0.40	1.02	5108	4534	0.7	17	2.5	0.50	25.28	2.4	FALSE	0.5	25.3	2.4	2.3	28	66	0.107	4992	3810	0.85	0.19	0.83	1.19	0.56	Yes	Yes	Yes
	40.20	-1.0	30.0	0.60	2.19	5132	4545	0.5	12	2.9	1.00	12.07	2.9	FALSE	1.0	12.1	2.9	5.2	14	73		5016	3822	0.85	0.19	0.83	1.19	100.00	No	Yes	No
	40.40	-1.2	19.4	0.50	2.97	5156	4557	0.5	7	3.1	1.00	7.38	3.1	FALSE	1.0	7.4	3.1	8.0	9	72		5040	3833	0.85	0.19	0.83	1.19	100.00	No	Yes	No
	40.50	-1.3	12.9	0.50	4.85	5168	4563	0.5	5	3.4	1.00	4.52	3.4	FALSE	1.0	4.5	3.4	12.3	6	74		5052	3839	0.84	0.19	0.83	1.19	100.00	No	Yes	No
	40.70	-1.5	19.3	0.40	2.39	5192	4574	0.5	7	3.1	1.00	7.30	3.1	FALSE	1.0	7.3	3.1	7.4	9	66		5076	3850	0.84	0.19	0.82	1.19	100.00	No	Yes	No
	40.80	-1.6	18.0	0.40	2.60	5204	4580	0.5	7	3.1	1.00	6.72	3.1	FALSE	1.0	6.7	3.1	8.0	8	67		5088	3856	0.84	0.19	0.82	1.19	100.00	No	Yes	No
	41.00	-1.8	15.2	0.40	3.18	5228	4592	0.5	5	3.2	1.00	5.48	3.2	FALSE	1.0	5.5	3.2	9.7	7	68		5112	3868	0.84	0.19	0.82	1.19	100.00	No	Yes	No
	41.20	-2.0	16.0	0.30	2.24	5252	4603	0.5	6	3.1	1.00	5.81	3.1	FALSE	1.0	5.8	3.1	8.3	7	61		5136	3879	0.84	0.19	0.82	1.19	100.00	No	Yes	No
	41.30	-2.1	18.6	0.40	2.51	5264	4609	0.5	7	3.1	1.00	6.93	3.1	FALSE	1.0	6.9	3.1	7.8	9	66		5148	3885	0.84	0.19	0.82	1.19	100.00	No	Yes	No
	41.50	-2.3	18.4	0.30	1.90	5288	4620	0.5	7	3.0	1.00	6.82	3.0	FALSE	1.0	6.8	3.0	7.1	8	60		5172	3896	0.84	0.19	0.82	1.19	100.00	No	Yes	No
	41.70	-2.5	16.5	0.40	2.89	5312	4632	0.5	6	3.2	1.00	5.98	3.2	FALSE	1.0	6.0	3.2	8.9	8	67		5196	3908	0.83	0.19	0.82	1.19	100.00	No	Yes	No
	41.80	-2.6	14.5	0.40	3.38	5324	4638	0.5	5	3.3	1.00	5.11	3.3	FALSE	1.0	5.1	3.3	10.2	7	68		5208	3914	0.83	0.19	0.82	1.19	100.00	No	Yes	No
	42.00	-2.8	28.5	0.20	0.77	5348	4649	0.5	11	2.7	1.00	11.11	2.7	FALSE	1.0	11.1	2.7	3.8	13	49		5232	3925	0.83	0.19	0.82	1.19	100.00	No	Yes	No
	42.20	-3.0	45.6	0.20	0.47	5372	4661	0.7	18	2.4	0.50	27.33	2.2	FALSE	0.5	27.3	2.2	1.7	31	53	0.094	5256	3937	0.83	0.19	0.82	1.19	0.49	Yes	Yes	Yes
	42.30	-3.1	52.3	0.20	0.40	5384	4666	0.7	21	2.3	0.50	31.57	2.1	FALSE	0.5	31.6	2.1	1.5	35	54	0.094	5268	3943	0.83	0.19	0.82	1.19	0.49	Yes	Yes	Yes
	42.50	-3.3	61.5	0.20	0.34	5408	4678	0.7	25	2.2	0.50	37.38	2.0	FALSE	0.5	37.4	2.0	1.4	41	56	0.096	5292	3954	0.83	0.19	0.82	1.19	0.50	Yes	Yes	Yes
	42.70	-3.5	65.5	0.20	0.32	5432	4689	0.7	27	2.2	0.50	39.86	2.0	FALSE	0.5	39.9	2.0	1.3	44	57	0.098	5316	3966	0.83	0.19	0.82	1.19	0.51	Yes	Yes	Yes
	42.80	-3.6	69.8	0.20	0.30	5444	4695	0.7	29	2.1	0.50	42.56	2.0	FALSE	0.5	42.6	2.0	1.3	47	59	0.099	5328	3971	0.83	0.19	0.82	1.19	0.51	Yes	Yes	Yes
	43.00	-3.8	67.7	0.20	0.31	5468	4707	0.7	28	2.1	0.50	41.17	2.0	FALSE	0.5	41.2	2.0	1.3	45	58	0.098	5352	3983	0.82	0.19	0.82	1.19	0.51	Yes	Yes	Yes
	43.10	-3.9	62.0	0.20	0.34	5480	4712	0.7	25	2.2	0.50	37.53	2.0	FALSE	0.5	37.5	2.0	1.4	42	56	0.097	5364	3989	0.82	0.19	0.82	1.19	0.50	Yes	Yes	Yes
	43.30	-4.1	59.5	0.30	0.53	5504	4724	0.7	24	2.3	0.50	35.90	2.1	FALSE	0.5	35.9	2.1	1.5	40	61	0.101	5388	4000	0.82	0.19	0.82	1.19	0.52	Yes	Yes	Yes
	43.50	-4.3	64.2	0.20	0.33	5528	4736	0.7	26	2.2	0.50	38.82	2.0	FALSE	0.5	38.8	2.0	1.3	43	57	0.097	5412	4012	0.82	0.19	0.82	1.19	0.50	Yes	Yes	Yes
	43.60	-4.4	76.0	0.30	0.41	5540	4741	0.7	31	2.1	0.50	46.24	2.0	FALSE	0.5	46.2	2.0	1.3	51	65	0.106	5424	4017	0.82	0.19	0.82	1.19	0.55	Yes	Yes	Yes
	43.80	-4.6	87.9	0.30	0.35	5564	4753	0.7	36	2.1	0.50	53.68	1.9	FALSE	0.5	53.7	1.9	1.2	59	70	0.112	5448	4029	0.82	0.19	0.82	1.19	0.58	Yes	Yes	Yes
	44.00	-4.8	95.0	0.30	0.33	5588	4764	0.7	39	2.0	0.50	58.08	1.9	FALSE	0.5	58.1	1.9	1.2	63	73	0.116	5472	4040	0.82	0.19	0.82	1.19	0.60	Yes	Yes	Yes
	44.10	-4.9	97.4	0.40	0.42	5600	4770	0.7	40	2.1	0.50	59.55	1.9	FALSE	0.5	59.6	1.9	1.2	65	77	0.122	5484	4046	0.82	0.19	0.82	1.19	0.63	Yes	Yes	Yes
	44.30	-5.1	91.5	0.40	0.45	5624	4782	0.7	37	2.1	0.50	55.76	1.9	FALSE	0.5	55.8	1.9	1.2	61	74	0.118	5508	4058	0.81	0.19	0.82	1.19	0.61	Yes	Yes	Yes
	44.50	-5.3	82.1	0.30	0.38	5648	4793	0.7	33	2.1	0.50	49.79	1.9	FALSE	0.5	49.8	1.9	1.2	55	67	0.108	5532	4069	0.81	0.19	0.82	1.19	0.56	Yes	Yes	Yes
	44.60	-5.4	68.9	0.30	0.45	5660	4799	0.7	28	2.2	0.50	41.47	2.0	FALSE	0.5	41.5	2.0	1.4	46	63	0.103	5544	4075	0.81	0.19	0.81	1.19	0.53	Yes	Yes	Yes
	44.80	-5.6	66.7	0.20	0.31	5684	4810	0.7	27	2.2	0.50	40.03	2.0	FALSE	0.5	40.0	2.0	1.3	44	58	0.098	5568	4087	0.81	0.19	0.81	1.19	0.51	Yes	Yes	Yes
	44.90	-5.7	64.5	0.20	0.32	5696	4816	0.7	26	2.2	0.50	38.63	2.0	FALSE	0.5	38.6	2.0	1.3	43	57	0.097	5580	4092	0.81	0.19	0.81	1.19	0.50	Yes	Yes	Yes
	45.10	-5.9	62.8	0.20	0.33	5720	4828	0.7	25	2.2	0.50	37.51	2.0	FALSE	0.5	37.5	2.0	1.4	42	56	0.096	5604	4104	0.81	0.19	0.81	1.19	0.50	Yes	Yes	Yes
	45.30	-6.1	63.3	0.20	0.33	5744	4839	0.7	25	2.2	0.50	37.77	2.0	FALSE	0.5	37.8	2.0	1.3	42	56	0.097	5628	4115	0.81	0.19	0.81	1.19	0.50	Yes	Yes	Yes
	45.40	-6.2	61.4	0.10	0.17	5756	4845	0.7	24	2.1	0.50	36.55	2.0	FALSE	0.5	36.6	2.0	1.3	41	51	0.092	5640	4121	0.80	0.19	0.81	1.19	0.48	Yes	Yes	Yes
	45.60	-6.4	60.0	0.20	0.35	5780	4856	0.7	24	2.2	0.50	35.63	2.1	FALSE	0.5	35.6	2.1	1.4	40	55	0.096	5664	4133	0.80	0.19	0.81	1.19	0.49	Yes	Yes	Yes
	45.80	-6.6	55.1	0.20	0.38	5804	4868	0.7	21	2.3	0.50	32.53	2.1	FALSE	0.5	32.5	2.1	1.5	36	54	0.095	5688	4144	0.80	0.19	0.81	1.19	0.49	Yes	Yes	Yes
	45.90	-6.7	55.1	0.10	0.19	5816	4874	0.7	21	2.2	0.50	32.50	2.0	FALSE	0.5	32.5	2.0	1.3	36	48	0.090	5700	4150	0.80	0.19	0.81	1.19	0.47	Yes	Yes	Yes
	46.10	-6.9	56.1	0.20	0.38	5840	4885	0.7	22	2.3	0.50	33.08	2.1	FALSE	0.5	33.1	2.1	1.5	37	54	0.095	5724	4161	0.80	0.19	0.81	1.19	0.49	Yes	Yes	Yes
	46.30	-7.1	57.6	0.20	0.37	5864	4897	0.7	22	2.3	0.50	33.97	2.1	FALSE	0.5	34.0	2.1	1.4	38	54	0.095	5748	4173	0.80	0.19	0.81	1.19	0.49	Yes	Yes	Yes
	46.40	-7.2	59.3	0.20	0.35	5876	4903	0.7	23	2.2	0.50	35.00	2.1	FALSE	0.5	35.0	2.1	1.4	39	55	0.095	5760	4179	0.80	0.19	0.81	1.19	0.49	Yes	Yes	Yes
	46.60	-7.4	60.2	0.20	0.35	5900	4914	0.7	23	2.2	0.50	35.51	2.1	FALSE	0.5	35.5	2.1	1.4	40	55	0.096	5784	4190	0.79	0.19	0.81	1.19	0.49	Yes	Yes	Yes
	46.80	-7.6	58.8	0.20	0.36	5924	4926	0.7	23	2.3	0.50	34.59	2.1	FALSE	0.5	34.6	2.1	1.4	39	55	0.095	5808	4202	0.79	0.19	0.81	1.19	0.49	Yes	Yes	Yes
	46.90	-7.7	58.3	0.20	0.36	5936	4931	0.7	22	2.3	0.50	34.26	2.1	FALSE	0.5	34.3	2.1	1.4	38	55	0.095	5820	4208	0.79	0.19	0.81	1.19	0.49	Yes	Yes	Yes
	47.10	-7.9	59.4	0.20	0.35	5960	4943	0.7	23	2.2	0.50	34.89	2.1	FALSE	0.5	34.9	2.1	1.4	39	55	0.095	5844	4219	0.79	0.19	0.81	1.19	0.49	Yes	Yes	Yes
	47.20	-8.0	60.9	0.20	0.35	5972	4949	0.7	23	2.2	0.50	35.79	2.1	FALSE	0.5	35.8	2.1	1.4	40	55	0.096	5856	4225	0.79	0.19	0.81	1.19	0.50	Yes	Yes	Yes
	47.40	-8.2	61.7	0.20	0.34	5996	4960	0.7	24	2.2	0.50	36.24	2.1	FALSE	0.5	36.2	2.1	1.4	40	55	0.096	5880	4236	0.79	0.19	0.81	1.19	0.50	Yes	Yes	Yes
	47.60	-8.4	60.9	0.20	0.35	6020	4972	0.7	23	2.2	0.50	35.70	2.1	FALSE	0.5	35.7	2.1	1.4	40	55	0.096	5904	4248	0.79	0.19	0.81	1.19	0.49	Yes	Yes	Yes
	47.70	-8.5	60.7	0.20	0.35	6032	4977	0.7	23	2.2	0.50	35.55	2.1	FALSE	0.5	35.5	2.1	1.4	40	55	0.096	5916	4254	0.79	0.19	0.81	1.19	0.49	Yes	Yes	Yes
	47.90	-8.7	61.3	0.20	0.34	6056	4989	0.7	23	2.2	0.50	35.87	2.1	FALSE	0.5	35.9	2.1	1.4	40	55	0.096	5940	4265	0.78	0.19	0.81	1.19	0.50	Yes	Yes	Yes
	48.10	-8.9	61.2	0.20	0.34	6080	5000	0.7	23	2.2	0.50	35.76	2.1	FALSE	0.5	35.8	2.1	1.4	40	55	0.096	5964	4277	0.78	0.19	0.81	1.19	0.50	Yes	Yes	Yes
	48.20	-9.0	62.0	0.20	0.34	6092	5006	0.7	24	2.2	0.50	36.23	2.1	FALSE	0.5	36.2	2.1	1.4	40	55	0.096	5976	4282	0.78	0.19	0.81	1.19	0.50	Yes	Yes	Yes
	48.40	-9.2	66.5	0.20	0.32	6116	5018	0.6	25	2.2	0.50	38.94	2.0	FALSE	0.5	38.9	2.0	1.3	43	57	0.097	6000	4294	0.78	0.19	0.81	1.19	0.50	Yes	Yes	Yes
	48.60	-9.4	69.5	0.20	0.30	6140	5029	0.6	26	2.2	0.50	40.73	2.0	FALSE	0.5	40.7	2.0	1.3	45	58	0.098	6024	4305	0.78	0.19	0.81	1.19	0.51	Yes	Yes	Yes

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
	48.70	-9.5	68.1	0.10	0.15	6152	5035	0.6	26	2.1	0.50	39.84	1.9	FALSE	0.5	39.8	1.9	1.2	44	53	0.094	6036	4311	0.78	0.19	0.81	1.19	0.49	Yes	Yes	Yes
	48.90	-9.7	65.2	0.20	0.32	6176	5047	0.6	25	2.2	0.50	38.01	2.0	FALSE	0.5	38.0	2.0	1.3	42	56	0.097	6060	4323	0.78	0.19	0.80	1.19	0.50	Yes	Yes	Yes
	49.00	-9.8	62.1	0.20	0.34	6188	5052	0.6	23	2.2	0.50	36.09	2.1	FALSE	0.5	36.1	2.1	1.4	40	55	0.096	6072	4328	0.78	0.19	0.80	1.19	0.50	Yes	Yes	Yes
	49.20	-10.0	64.6	0.20	0.33	6212	5064	0.6	24	2.2	0.50	37.57	2.0	FALSE	0.5	37.6	2.0	1.3	42	56	0.096	6096	4340	0.77	0.19	0.80	1.19	0.50	Yes	Yes	Yes
	49.40	-10.2	64.4	0.20	0.33	6236	5075	0.6	24	2.2	0.50	37.40	2.0	FALSE	0.5	37.4	2.0	1.3	42	56	0.096	6120	4352	0.77	0.18	0.80	1.19	0.50	Yes	Yes	Yes
	49.50	-10.3	65.6	0.20	0.32	6248	5081	0.6	25	2.2	0.50	38.11	2.0	FALSE	0.5	38.1	2.0	1.3	42	56	0.097	6132	4357	0.77	0.18	0.80	1.19	0.50	Yes	Yes	Yes
	49.70	-10.5	67.7	0.20	0.31	6272	5093	0.6	25	2.2	0.50	39.34	2.0	FALSE	0.5	39.3	2.0	1.3	44	57	0.097	6156	4369	0.77	0.18	0.80	1.19	0.50	Yes	Yes	Yes
	49.90	-10.7	67.8	0.20	0.31	6296	5104	0.6	25	2.2	0.50	39.35	2.0	FALSE	0.5	39.3	2.0	1.3	44	57	0.097	6180	4380	0.77	0.18	0.80	1.19	0.50	Yes	Yes	Yes
	50.00	-10.8	69.0	0.20	0.30	6308	5110	0.6	26	2.2	0.50	40.05	2.0	FALSE	0.5	40.0	2.0	1.3	44	57	0.098	6192	4386	0.77	0.18	0.80	1.19	0.51	Yes	Yes	Yes
	50.20	-11.0	69.7	0.20	0.30	6332	5121	0.6	26	2.2	0.50	40.42	2.0	FALSE	0.5	40.4	2.0	1.3	45	58	0.098	6216	4398	0.77	0.18	0.80	1.19	0.51	Yes	Yes	Yes
	50.40	-11.2	72.0	0.20	0.29	6356	5133	0.6	27	2.2	0.50	41.77	2.0	FALSE	0.5	41.8	2.0	1.3	46	58	0.099	6240	4409	0.76	0.18	0.80	1.19	0.51	Yes	Yes	Yes
	50.50	-11.3	68.4	0.20	0.31	6368	5139	0.6	25	2.2	0.50	39.55	2.0	FALSE	0.5	39.6	2.0	1.3	44	57	0.097	6252	4415	0.76	0.18	0.80	1.19	0.51	Yes	Yes	Yes
	50.70	-11.5	70.0	0.20	0.30	6392	5150	0.6	26	2.2	0.50	40.47	2.0	FALSE	0.5	40.5	2.0	1.3	45	58	0.098	6276	4426	0.76	0.18	0.80	1.19	0.51	Yes	Yes	Yes
	50.90	-11.7	70.8	0.20	0.30	6416	5162	0.6	26	2.2	0.50	40.90	2.0	FALSE	0.5	40.9	2.0	1.3	45	58	0.098	6300	4438	0.76	0.18	0.80	1.19	0.51	Yes	Yes	Yes
	51.00	-11.8	75.5	0.20	0.28	6428	5168	0.6	28	2.1	0.50	43.72	1.9	FALSE	0.5	43.7	1.9	1.2	48	60	0.100	6312	4444	0.76	0.18	0.80	1.19	0.52	Yes	Yes	Yes
	51.20	-12.0	81.8	0.30	0.38	6452	5179	0.6	30	2.1	0.50	47.47	2.0	FALSE	0.5	47.5	2.0	1.3	52	66	0.106	6336	4455	0.76	0.18	0.80	1.19	0.55	Yes	Yes	Yes
	51.30	-12.1	84.4	0.30	0.37	6464	5185	0.6	31	2.1	0.50	49.01	1.9	FALSE	0.5	49.0	1.9	1.2	54	67	0.108	6348	4461	0.76	0.18	0.80	1.19	0.56	Yes	Yes	Yes
	51.50	-12.3	83.5	0.30	0.37	6488	5196	0.6	31	2.1	0.50	48.41	2.0	FALSE	0.5	48.4	2.0	1.2	53	66	0.107	6372	4472	0.75	0.18	0.80	1.19	0.56	Yes	Yes	Yes
	51.70	-12.5	81.1	0.30	0.39	6512	5208	0.6	30	2.2	0.50	46.90	2.0	FALSE	0.5	46.9	2.0	1.3	52	65	0.106	6396	4484	0.75	0.18	0.80	1.19	0.55	Yes	Yes	Yes
	51.80	-12.6	81.8	0.30	0.38	6524	5214	0.6	30	2.1	0.50	47.29	2.0	FALSE	0.5	47.3	2.0	1.3	52	66	0.106	6408	4490	0.75	0.18	0.80	1.19	0.55	Yes	Yes	Yes
	52.00	-12.8	85.1	0.30	0.37	6548	5225	0.6	31	2.1	0.50	49.22	1.9	FALSE	0.5	49.2	1.9	1.2	54	67	0.108	6432	4501	0.75	0.18	0.80	1.19	0.56	Yes	Yes	Yes
	52.20	-13.0	88.8	0.20	0.23	6572	5237	0.6	33	2.0	0.50	51.38	1.9	FALSE	0.5	51.4	1.9	1.1	56	65	0.105	6456	4513	0.75	0.18	0.80	1.19	0.55	Yes	Yes	Yes
	52.30	-13.1	92.3	0.20	0.22	6584	5242	0.6	34	2.0	0.50	53.45	1.8	FALSE	0.5	53.4	1.8	1.1	59	66	0.107	6468	4519	0.75	0.18	0.80	1.19	0.56	Yes	Yes	Yes
	52.50	-13.3	89.7	0.30	0.35	6608	5254	0.6	33	2.1	0.50	51.82	1.9	FALSE	0.5	51.8	1.9	1.2	57	68	0.110	6492	4530	0.75	0.18	0.80	1.19	0.57	Yes	Yes	Yes
	52.70	-13.5	91.2	0.30	0.34	6632	5265	0.6	33	2.1	0.50	52.66	1.9	FALSE	0.5	52.7	1.9	1.2	58	69	0.110	6516	4542	0.75	0.18	0.80	1.19	0.58	Yes	Yes	Yes
	52.80	-13.6	87.6	0.30	0.36	6644	5271	0.6	32	2.1	0.50	50.47	1.9	FALSE	0.5	50.5	1.9	1.2	56	68	0.109	6528	4547	0.74	0.18	0.80	1.19	0.57	Yes	Yes	Yes
	53.00	-13.8	80.7	0.30	0.39	6668	5283	0.6	29	2.2	0.50	46.28	2.0	FALSE	0.5	46.3	2.0	1.3	51	65	0.105	6552	4559	0.74	0.18	0.80	1.19	0.55	Yes	Yes	Yes
	53.20	-14.0	80.7	0.20	0.26	6692	5294	0.6	29	2.1	0.50	46.22	1.9	FALSE	0.5	46.2	1.9	1.2	51	61	0.101	6576	4570	0.74	0.18	0.80	1.19	0.53	Yes	Yes	Yes
	53.30	-14.1	83.2	0.20	0.25	6704	5300	0.6	30	2.1	0.50	47.69	1.9	FALSE	0.5	47.7	1.9	1.2	53	62	0.102	6588	4576	0.74	0.18	0.79	1.19	0.54	Yes	Yes	Yes
	53.50	-14.3	82.9	0.30	0.38	6728	5312	0.6	30	2.1	0.50	47.45	2.0	FALSE	0.5	47.4	2.0	1.3	52	66	0.106	6612	4588	0.74	0.18	0.79	1.19	0.56	Yes	Yes	Yes
	53.60	-14.4	85.9	0.20	0.24	6740	5317	0.6	31	2.1	0.50	49.21	1.9	FALSE	0.5	49.2	1.9	1.2	54	63	0.104	6624	4593	0.74	0.18	0.79	1.19	0.54	Yes	Yes	Yes
	53.80	-14.6	86.2	0.30	0.36	6764	5329	0.6	31	2.1	0.50	49.33	1.9	FALSE	0.5	49.3	1.9	1.2	54	67	0.108	6648	4605	0.74	0.18	0.79	1.19	0.56	Yes	Yes	Yes
	54.00	-14.8	84.4	0.30	0.37	6788	5340	0.6	30	2.1	0.50	48.20	2.0	FALSE	0.5	48.2	2.0	1.2	53	66	0.107	6672	4616	0.73	0.18	0.79	1.19	0.56	Yes	Yes	Yes
	54.10	-14.9	81.4	0.30	0.38	6800	5346	0.6	29	2.2	0.50	46.38	2.0	FALSE	0.5	46.4	2.0	1.3	51	65	0.106	6684	4622	0.73	0.18	0.79	1.19	0.55	Yes	Yes	Yes
	54.30	-15.1	81.9	0.30	0.38	6824	5358	0.6	29	2.2	0.50	46.62	2.0	FALSE	0.5	46.6	2.0	1.3	51	65	0.106	6708	4634	0.73	0.18	0.79	1.19	0.55	Yes	Yes	Yes
	54.50	-15.3	82.7	0.20	0.25	6848	5369	0.6	30	2.1	0.50	47.04	1.9	FALSE	0.5	47.0	1.9	1.2	52	62	0.102	6732	4645	0.73	0.18	0.79	1.19	0.53	Yes	Yes	Yes
	54.60	-15.4	81.1	0.20	0.26	6860	5375	0.6	29	2.1	0.50	46.06	1.9	FALSE	0.5	46.1	1.9	1.2	51	61	0.101	6744	4651	0.73	0.18	0.79	1.19	0.53	Yes	Yes	Yes
	54.80	-15.6	75.3	0.30	0.42	6884	5386	0.6	27	2.2	0.50	42.57	2.0	FALSE	0.5	42.6	2.0	1.3	47	63	0.103	6768	4663	0.73	0.18	0.79	1.19	0.54	Yes	Yes	Yes
	55.00	-15.8	76.6	0.30	0.41	6908	5398	0.6	27	2.2	0.50	43.29	2.0	FALSE	0.5	43.3	2.0	1.3	48	63	0.104	6792	4674	0.73	0.18	0.79	1.19	0.54	Yes	Yes	Yes
	55.10	-15.9	76.9	0.30	0.41	6920	5404	0.6	27	2.2	0.50	43.44	2.0	FALSE	0.5	43.4	2.0	1.3	48	63	0.104	6804	4680	0.73	0.18	0.79	1.19	0.54	Yes	Yes	Yes
	55.30	-16.1	76.6	0.30	0.41	6944	5415	0.6	27	2.2	0.50	43.21	2.0	FALSE	0.5	43.2	2.0	1.3	48	63	0.103	6828	4691	0.72	0.18	0.79	1.19	0.54	Yes	Yes	Yes
	55.40	-16.2	73.4	0.30	0.43	6956	5421	0.6	26	2.2	0.50	41.29	2.0	FALSE	0.5	41.3	2.0	1.4	46	62	0.102	6840	4697	0.72	0.18	0.79	1.19	0.54	Yes	Yes	Yes
	55.60	-16.4	74.9	0.40	0.56	6980	5432	0.6	26	2.3	0.50	42.12	2.1	FALSE	0.5	42.1	2.1	1.4	47	67	0.108	6864	4709	0.72	0.18	0.79	1.19	0.57	Yes	Yes	Yes
	55.80	-16.6	85.8	0.60	0.73	7004	5444	0.6	30	2.3	0.50	48.50	2.1	FALSE	0.5	48.5	2.1	1.4	53	77	0.122	6888	4720	0.72	0.18	0.79	1.19	0.64	Yes	Yes	Yes
	55.90	-16.7	125.8	0.90	0.74	7016	5450	0.6	45	2.1	0.50	72.02	1.9	FALSE	0.5	72.0	1.9	1.2	78	97	0.164	6900	4726	0.72	0.18	0.79	1.19	0.86	Yes	Yes	Yes
	56.10	-16.9	173.6	1.20	0.71	7040	5461	0.6	62	2.0	0.50	100.06	1.8	FALSE	0.5	100.1	1.8	1.1	108	121	0.245	6924	4737	0.72	0.18	0.79	1.19	1.29	Yes	Yes	Yes
	56.30	-17.1	190.6	0.80	0.43	7064	5473	0.6	68	1.8	0.50	109.94	1.7	FALSE	0.5	109.9	1.7	1.0	119	120	0.241	6948	4749	0.72	0.18	0.79	1.19	1.27	Yes	Yes	Yes
	56.40	-17.2	147.1	1.00	0.70	7076	5479	0.6	52	2.0	0.50	84.33	1.9	FALSE	0.5	84.3	1.9	1.2	91	107	0.193	6960	4755	0.72	0.18	0.79	1.19	1.02	Yes	Yes	Yes
	56.60	-17.4	158.2	0.70	0.45	7100	5490	0.6	56	1.9	0.50	90.75	1.7	FALSE	0.5	90.7	1.7	1.1	98	105	0.188	6984	4766	0.71	0.18	0.79	1.19	0.99	Yes	Yes	Yes
	56.80	-17.6	137.9	1.30	0.97	7124	5502	0.6	49	2.2	0.50	78.75	2.0	FALSE	0.5	78.7	2.0	1.3	86	109	0.201	7008	4778	0.71	0.18	0.79	1.19	1.06	Yes	Yes	Yes
	56.90	-17.7	138.9	0.90	0.67	7136	5507	0.6	49	2.1	0.50	79.29	1.9	FALSE	0.5	79.3	1.9	1.2	86	101	0.176	7020	4784	0.71	0.18	0.79	1.19	0.93	Yes	Yes	Yes
	57.10	-17.9	103.9	0.40	0.40	7160	5519	0.6	36	2.1	0.50	58.71	1.9	FALSE	0.5	58.7	1.9	1.2	64	76	0.121	7044	4795	0.71	0.18	0.79	1.19	0.64	Yes	Yes	Yes
	57.30	-18.1	129.3	0.40	0.32	7184	5530	0.6	45	2.0	0.50	73.49	1.8	FALSE	0.5	73.5	1.8	1.1	80	86	0.140	7068	4807	0.71	0.18	0.79	1.19	0.74	Yes	Yes	Yes
	57.40	-18.2	123.2	1.20	1.00	7196	5536	0.6	43	2.2	0.50	69.89	2.0	FALSE	0.5	69.9	2.0	1.3	76	103	0.180	7080	4812	0.71	0.18	0.79	1.19	0.95	Yes	Yes	Yes
	57.60	-18.4	135.6	1.00	0.76	7220	5548	0.6	48	2.1	0.50	77.05	1.9	FALSE	0.5	77.0	1.9	1.2	84	102	0.178	7104	4824	0.71	0.18	0.79	1.19	0.94	Yes	Yes	Yes
	57.70	-18.5	109.7	1.00	0.94	7232	5553	0.6	38	2.2	0.50	61.89	2.1	FALSE	0.5	61.9	2.1	1.4	68	94	0.157	7116	4830	0.70	0.18	0.79	1.19	0.83	Yes	Yes	Yes
	57.90	-18.7	119.4	0.80	0.69	7256	5565	0.6	42	2.1	0.50	67.48	2.0	FALSE	0.5	67.5	2.0	1.2	74	92	0.151	7140	4841	0.70	0.18	0.79	1.19	0.80	Yes	Yes	Yes
	58.10	-18.9	93.4	0.40	0.45	7280	5576	0.6	32	2.1	0.50	52.26	2.0	FALSE	0.5	52.3	2.0	1.2	58	72	0.114	7164	4853	0.70	0.18	0.78	1.19	0.61	Yes	Yes	Yes
	58.20	-19.0	93.7	0.30	0.33	7292	5582	0.6	32	2.1	0.50	52.40	1.9	FALSE	0.5	52.4	1.9	1.2	58	69	0.110	7176	4858	0.70	0.18	0.78	1.19	0.59	Yes	Yes	Yes
	58.40	-19.2	95.0	0.10	0.11	7316	5594	0.6	33	2.0	0.50	53.10	1.8	FALSE	0.5	53.1	1.8	1.1	58	63	0.103	7200	4870	0.70	0.18	0.78	1.19	0.55	Yes	Yes	Yes
	58.60	-19.4	87.9	0.20	0.24	7340	5605	0.6	30	2.1	0.50	48.91	1.9	FALSE	0.5	48.9	1.9	1.2	54	63	0.103	7224	4881	0.70	0.18	0.78	1.19	0.55	Yes	Yes	Yes
	58.70	-19.5	96.6	0.20	0.22	7352	5611	0.6	33	2.0	0.50	53.94	1.8	FALSE	0.5	53.9	1.8	1.1	59	67	0.108	7236	4887	0.70	0.18	0.78	1.19	0.57	Yes	Yes	Yes
	58.90	-19.7	91.6	0.10	0.11	7376	5623	0.6	31	2.0	0.50	50.97	1.8	FALSE	0.5	51.0	1.8	1.1	56	62	0.102	7260	4899	0.69	0.18	0.78	1.19	0.54	Yes	Yes	Yes
	59.10	-19.9	93.1	0.20	0.22	7400	5634	0.6	32	2.0	0.50	51.78	1.8	FALSE	0.5	51.8	1.8	1.1	57	65	0.106	7284	4910	0.69	0.18	0.78	1.19	0.56	Yes	Yes	Yes
	59.20	-20.0	106.5	0.30	0.29	7412	5640	0.6	36	2.0	0.50	59.51	1.8	FALSE	0.5	59.5	1.8	1.1	65	74	0.117	7296	4916	0.69	0.17	0.78	1.19	0.62	Yes	Yes	Yes
	59.40	-20.2	120.0	0.70	0.60	7436	5651	0.6	41	2.1	0.50	67.25	1.9	FALSE	0.5	67.3	1.9	1.2	73	89	0.145	7320	4928	0.69	0.17	0.78	1.19	0.78	Yes	Yes	Yes
	59.50	-20.3	125.7	0.40	0.33	7448	5657	0.6	43	2.0	0.50	70.51	1.8	FALSE	0.5	70.5	1.8	1.1	77	84	0.135	7332	4933	0.69	0.17	0.78	1.19	0.72	Yes	Yes	Yes
	59.70	-20.5	113.4	0.60	0.55	7472	5669	0.6	39	2.1	0.50	63.33	1.9	FALSE	0.5	63.3	1.9	1.2	69	84	0.135	7356	4945	0.69	0.17	0.78	1.19	0.72	Yes	Yes	Yes
	59.90	-20.7	107.8	0.60	0.58	7496	5680	0.6	37	2.1	0.50	60.03	2.0	FALSE	0.5	60.0	2.0	1.2	66	82	0.131	7380	4956	0.69	0.17	0.78	1.19	0.70	Yes	Yes	Yes
	60.00	-20.8	112.8	0.50	0.46	7508	5686	0.6	38	2.1	0.50	62.88	1.9	FALSE	0.5	62.9	1.9	1.2	69	81	0.130	7392	4962	0.69	0.17	0.78	1.19	0.69	Yes	Yes	Yes
	60.20	-21.0	101.0	0.50	0.51	7532	5697	0.6	34	2.1	0.50	56.01	2.0	FALSE	0.5	56.0	2.0	1.2	62	77	0.122	7416	4974	0.68	0.17	0.78	1.19	0.65	Yes	Yes	Yes
	60.40	-21.2	104.6	0.30	0.30	7556	5709	0.6	35	2.0	0.50	58.02	1.8	FALSE	0.5	58.0	1.8	1.1	64	73	0.115	7440	4985	0.68	0.17	0.78	1.19	0.62	Yes	Yes	Yes
	60.50	-21.3	106.5	0.10	0.10	7568	5715	0.6	36	1.9	0.50	59.08	1.7	FALSE	0.5	59.1	1.7	1.0	65	68	0.109	7452	4991	0.68	0.17	0.78	1.19	0.59	Yes	Yes	Yes
	60.70	-21.5	117.8	0.40	0.35	7592	5726	0.6	40	2.0	0.50	65.50	1.8	FALSE	0.5	65.5	1.8	1.1	72	80	0.128	7476	5002	0.68	0.17	0.78	1.19	0.69	Yes	Yes	Yes
	60.90	-21.7	124.2	0.30	0.25	7616	5738	0.6	42	1.9	0.50	69.10	1.7	FALSE	0.5	69.1	1.7	1.1	75	80	0.128	7500	5014	0.68	0.17	0.78	1.19	0.69	Yes	Yes	Yes
	61.00	-21.8	128.6	0.10	0.08	7628	5744	0.6	43	1.8	0.50	71.59	1.6	FALSE	0.5	71.6	1.6	1.0	78	78	0.124	7512	5020	0.68	0.17	0.78	1.19	0.67	Yes	Yes	Yes
	61.20	-22.0	134.5	0.10	0.08	7652	5755	0.6	45	1.8	0.50	74.89	1.6	FALSE	0.5	74.9	1.6	1.0	82	82	0.130	7536	5031	0.68	0.17	0.78	1.19	0.70	Yes	Yes	Yes
	61.40	-22.2	131.9	0.20	0.16	7676	5767	0.6	44	1.9	0.50	73.32	1.7	FALSE	0.5	73.3	1.7	1.0	80	81	0.129	7560	5043	0.67	0.17	0.78	1.19	0.69	Yes	Yes	Yes
	61.50	-22.3	125.2	0.10	0.08	7688	5772	0.6	42	1.9	0.50	69.45	1.6	FALSE	0.5	69.4	1.6	1.0	76	76	0.120	7572	5048	0.67	0.17	0.78	1.19	0.65	Yes	Yes	Yes
	61.70	-22.5	103.2	0.10	0.10	7712	5784	0.6	34	1.9	0.50	56.79	1.7	FALSE	0.5	56.8	1.7	1.1	62	66	0.107	7596	5060	0.67	0.17	0.78	1.19	0.58	Yes	Yes	Yes
	61.80	-22.6	89.9	0.10	0.12	7724	5790	0.6	30	2.0	0.50	49.16	1.8	FALSE	0.5	49.2	1.8	1.1	54	60	0.100	7608	5066	0.67	0.17	0.78	1.19	0.54	Yes	Yes	Yes
	62.00	-22.8	95.7	0.20	0.22	7748	5801	0.6	32	2.0	0.50	52.42	1.8	FALSE	0.5	52.4	1.8	1.1	58	66	0.106	7632	5077	0.67	0.17	0.78	1.19	0.57	Yes	Yes	Yes
	62.20	-23.0	107.1	0.40	0.39	7772	5813	0.6	36	2.1	0.50	58.86	1.9	FALSE	0.5	58.9	1.9	1.2	65	76	0.120	7656	5089	0.67	0.17	0.78	1.19	0.65	Yes	Yes	Yes
	62.30	-23.1	133.9	0.50	0.38	7784	5818	0.6	45	2.0	0.50	74.10	1.8	FALSE	0.5	74.1	1.8	1.1	81	89	0.145	7668	5095	0.67	0.17	0.78	1.19	0.79	Yes	Yes	Yes
	62.50	-23.3	137.5	0.30	0.22	7808	5830	0.6	46	1.9	0.50	76.07	1.7	FALSE	0.5	76.1	1.7	1.0	83	85	0.138	7692	5106	0.67	0.17	0.78	1.19	0.75	Yes	Yes	Yes
	62.70	-23.5	115.7	0.50	0.45	7832	5841	0.6	38	2.1	0.50	63.59	1.9	FALSE	0.5	63.6	1.9	1.2	70	82	0.130	7716	5118	0.66	0.17	0.78	1.19	0.71	Yes	Yes	Yes
	62.80	-23.6	116.4	0.40	0.36	7844	5847	0.6	38	2.0	0.50	63.95	1.8	FALSE	0.5	64.0	1.8	1.1	70	79	0.126	7728	5123	0.66	0.17	0.78	1.19	0.69	Yes	Yes	Yes
	63.00	-23.8	125.5	0.40	0.33	7868	5859	0.6	41	2.0	0.50	69.05	1.8	FALSE	0.5	69.1	1.8	1.1	75	83	0.133	7752	5135	0.66	0.17	0.78	1.19	0.72	Yes	Yes	Yes
	63.20	-24.0	138.3	0.30	0.22	7892	5870	0.6	46	1.9	0.50	76.24	1.7	FALSE	0.5	76.2	1.7	1.0	83	85	0.138	7776	5146	0.66	0.17	0.77	1.19	0.75	Yes	Yes	Yes
	63.30	-24.1	143.5	0.60	0.43	7904	5876	0.6	47	2.0	0.50	79.15	1.8	FALSE	0.5	79.2	1.8	1.1	86	95	0.159	7788	5152	0.66	0.17	0.77	1.19	0.86	Yes	Yes	Yes
	63.50	-24.3	125.2	0.80	0.66	7928	5888	0.6	41	2.1	0.50	68.70	1.9	FALSE	0.5	68.7	1.9	1.2	75	92	0.152	7812	5164	0.66	0.17	0.77	1.19	0.83	Yes	Yes	Yes
	63.60	-24.4	94.9	0.50	0.55	7940	5893	0.6	31	2.2	0.50	51.50	2.0	FALSE	0.5	51.5	2.0	1.3	57	74	0.118	7824	5169	0.66	0.17	0.77	1.19	0.64	Yes	Yes	Yes

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
	63.80	-24.6	78.6	0.40	0.54	7964	5905	0.6	25	2.3	0.50	42.22	2.1	FALSE	0.5	42.2	2.1	1.4	47	66	0.107	7848	5181	0.65	0.17	0.77	1.19	0.59	Yes	Yes	Yes
	64.00	-24.8	72.5	0.10	0.15	7988	5916	0.6	23	2.1	0.50	38.72	1.9	FALSE	0.5	38.7	1.9	1.2	43	52	0.093	7872	5192	0.65	0.17	0.77	1.19	0.51	Yes	Yes	Yes
	64.10	-24.9	68.1	0.10	0.16	8000	5922	0.6	22	2.2	0.50	36.22	2.0	FALSE	0.5	36.2	2.0	1.2	41	51	0.092	7884	5198	0.65	0.17	0.77	1.19	0.50	Yes	Yes	Yes
	64.30	-25.1	64.6	0.10	0.17	8024	5934	0.6	20	2.2	0.50	34.20	2.0	FALSE	0.5	34.2	2.0	1.3	39	49	0.091	7908	5210	0.65	0.17	0.77	1.19	0.50	Yes	Yes	Yes
	64.50	-25.3	62.3	0.10	0.17	8048	5945	0.6	20	2.2	0.50	32.86	2.0	FALSE	0.5	32.9	2.0	1.3	37	49	0.090	7932	5221	0.65	0.17	0.77	1.19	0.50	Yes	Yes	Yes
	64.60	-25.4	63.4	0.30	0.51	8060	5951	0.6	20	2.4	0.50	33.46	2.2	FALSE	0.5	33.5	2.2	1.6	38	59	0.099	7944	5227	0.65	0.17	0.77	1.19	0.54	Yes	Yes	Yes
	64.80	-25.6	65.1	0.20	0.33	8084	5962	0.6	20	2.3	0.50	34.38	2.1	FALSE	0.5	34.4	2.1	1.4	39	54	0.095	7968	5239	0.65	0.17	0.77	1.19	0.52	Yes	Yes	Yes
	65.00	-25.8	66.3	0.40	0.64	8108	5974	0.6	21	2.4	0.50	35.01	2.2	FALSE	0.5	35.0	2.2	1.6	39	64	0.105	7992	5250	0.65	0.17	0.77	1.19	0.58	Yes	Yes	Yes
	65.10	-25.9	66.4	0.50	0.80	8120	5980	0.6	21	2.4	0.50	35.05	2.2	FALSE	0.5	35.1	2.2	1.7	39	69	0.110	8004	5256	0.64	0.17	0.77	1.19	0.61	Yes	Yes	Yes
	65.30	-26.1	85.3	0.40	0.49	8144	5991	0.6	27	2.2	0.50	45.63	2.0	FALSE	0.5	45.6	2.0	1.3	51	68	0.109	8028	5267	0.64	0.17	0.77	1.19	0.60	Yes	Yes	Yes
	65.50	-26.3	94.1	0.30	0.33	8168	6003	0.6	30	2.1	0.50	50.51	1.9	FALSE	0.5	50.5	1.9	1.2	56	67	0.108	8052	5279	0.64	0.17	0.77	1.19	0.60	Yes	Yes	Yes
	65.60	-26.4	114.0	0.30	0.27	8180	6008	0.6	37	2.0	0.50	61.65	1.8	FALSE	0.5	61.6	1.8	1.1	68	75	0.119	8064	5285	0.64	0.17	0.77	1.19	0.66	Yes	Yes	Yes
	65.80	-26.6	126.8	0.30	0.24	8204	6020	0.6	41	2.0	0.50	68.76	1.7	FALSE	0.5	68.8	1.7	1.1	75	80	0.128	8088	5296	0.64	0.17	0.77	1.19	0.71	Yes	Yes	Yes
	65.90	-26.7	131.7	0.30	0.24	8216	6026	0.6	42	1.9	0.50	71.46	1.7	FALSE	0.5	71.5	1.7	1.1	78	82	0.131	8100	5302	0.64	0.17	0.77	1.19	0.73	Yes	Yes	Yes
	66.10	-26.9	134.7	0.30	0.23	8240	6037	0.6	43	1.9	0.50	73.07	1.7	FALSE	0.5	73.1	1.7	1.0	80	83	0.134	8124	5313	0.64	0.17	0.77	1.19	0.74	Yes	Yes	Yes
	66.30	-27.1	132.7	0.50	0.39	8264	6049	0.6	43	2.0	0.50	71.87	1.8	FALSE	0.5	71.9	1.8	1.1	78	87	0.142	8148	5325	0.63	0.17	0.77	1.19	0.79	Yes	Yes	Yes
	66.40	-27.2	143.8	0.60	0.43	8276	6055	0.6	46	2.0	0.50	78.04	1.8	FALSE	0.5	78.0	1.8	1.1	85	94	0.156	8160	5331	0.63	0.17	0.77	1.19	0.87	Yes	Yes	Yes
	66.60	-27.4	129.5	0.70	0.56	8300	6066	0.6	41	2.1	0.50	69.97	1.9	FALSE	0.5	70.0	1.9	1.2	76	90	0.148	8184	5342	0.63	0.16	0.77	1.19	0.83	Yes	Yes	Yes
	66.80	-27.6	107.3	0.60	0.58	8324	6078	0.6	34	2.2	0.50	57.52	2.0	FALSE	0.5	57.5	2.0	1.3	63	80	0.128	8208	5354	0.63	0.16	0.77	1.19	0.71	Yes	Yes	Yes
	66.90	-27.7	113.6	0.50	0.46	8336	6083	0.6	36	2.1	0.50	61.00	1.9	FALSE	0.5	61.0	1.9	1.2	67	80	0.127	8220	5360	0.63	0.16	0.77	1.19	0.71	Yes	Yes	Yes
	67.10	-27.9	110.8	0.30	0.28	8360	6095	0.6	35	2.0	0.50	59.38	1.8	FALSE	0.5	59.4	1.8	1.1	65	73	0.117	8244	5371	0.63	0.16	0.77	1.19	0.65	Yes	Yes	Yes
	67.30	-28.1	114.2	0.30	0.27	8384	6106	0.6	36	2.0	0.50	61.21	1.8	FALSE	0.5	61.2	1.8	1.1	67	75	0.119	8268	5383	0.63	0.16	0.77	1.19	0.66	Yes	Yes	Yes
	67.40	-28.2	121.5	0.50	0.43	8396	6112	0.6	38	2.1	0.50	65.23	1.9	FALSE	0.5	65.2	1.9	1.2	71	83	0.132	8280	5388	0.63	0.16	0.77	1.19	0.74	Yes	Yes	Yes
	67.60	-28.4	129.4	0.40	0.32	8420	6124	0.6	41	2.0	0.50	69.56	1.8	FALSE	0.5	69.6	1.8	1.1	76	83	0.134	8304	5400	0.62	0.16	0.77	1.19	0.75	Yes	Yes	Yes
	67.70	-28.5	130.8	0.20	0.16	8432	6129	0.6	41	1.9	0.50	70.30	1.7	FALSE	0.5	70.3	1.7	1.0	77	79	0.125	8316	5406	0.62	0.16	0.77	1.19	0.70	Yes	Yes	Yes
	67.90	-28.7	116.9	0.20	0.18	8456	6141	0.6	37	2.0	0.50	62.51	1.7	FALSE	0.5	62.5	1.7	1.1	69	73	0.116	8340	5417	0.62	0.16	0.77	1.19	0.65	Yes	Yes	Yes
	68.10	-28.9	93.8	0.10	0.11	8480	6152	0.6	29	2.0	0.50	49.64	1.8	FALSE	0.5	49.6	1.8	1.1	55	61	0.101	8364	5429	0.62	0.16	0.77	1.19	0.57	Yes	Yes	Yes
	68.20	-29.0	90.1	0.20	0.23	8492	6158	0.6	28	2.1	0.50	47.57	1.9	FALSE	0.5	47.6	1.9	1.2	53	62	0.102	8376	5434	0.62	0.16	0.77	1.19	0.58	Yes	Yes	Yes
	68.40	-29.2	100.2	0.20	0.21	8516	6170	0.6	31	2.0	0.50	53.11	1.8	FALSE	0.5	53.1	1.8	1.1	59	66	0.107	8400	5446	0.62	0.16	0.77	1.19	0.60	Yes	Yes	Yes
	68.60	-29.4	131.4	0.30	0.24	8540	6181	0.6	41	1.9	0.50	70.30	1.7	FALSE	0.5	70.3	1.7	1.1	77	81	0.130	8424	5457	0.62	0.16	0.76	1.19	0.73	Yes	Yes	Yes
	68.70	-29.5	170.4	0.30	0.18	8552	6187	0.6	54	1.8	0.50	91.83	1.6	FALSE	0.5	91.8	1.6	1.0	100	100	0.172	8436	5463	0.61	0.16	0.76	1.19	0.97	Yes	Yes	Yes
	68.90	-29.7	188.8	0.50	0.27	8576	6199	0.6	60	1.8	0.50	101.89	1.6	FALSE	0.5	101.9	1.6	1.0	110	110	0.205	8460	5475	0.61	0.16	0.76	1.19	1.16	Yes	Yes	Yes
	69.10	-29.9	180.4	0.70	0.40	8600	6210	0.6	57	1.9	0.50	97.16	1.7	FALSE	0.5	97.2	1.7	1.0	105	109	0.200	8484	5486	0.61	0.16	0.76	1.19	1.13	Yes	Yes	Yes
	69.20	-30.0	171.1	0.60	0.36	8612	6216	0.6	54	1.9	0.50	91.98	1.7	FALSE	0.5	92.0	1.7	1.0	100	103	0.182	8496	5492	0.61	0.16	0.76	1.19	1.03	Yes	Yes	Yes
	69.40	-30.2	125.8	0.50	0.41	8636	6227	0.6	39	2.1	0.50	66.93	1.8	FALSE	0.5	66.9	1.8	1.1	73	84	0.134	8520	5504	0.61	0.16	0.76	1.19	0.76	Yes	Yes	Yes
	69.60	-30.4	115.0	0.30	0.27	8660	6239	0.6	35	2.0	0.50	60.92	1.8	FALSE	0.5	60.9	1.8	1.1	67	74	0.118	8544	5515	0.61	0.16	0.76	1.19	0.67	Yes	Yes	Yes
	69.70	-30.5	119.9	0.30	0.26	8672	6245	0.6	37	2.0	0.50	63.58	1.8	FALSE	0.5	63.6	1.8	1.1	70	76	0.121	8556	5521	0.61	0.16	0.76	1.19	0.69	Yes	Yes	Yes
	69.90	-30.7	136.6	0.30	0.23	8696	6256	0.6	42	1.9	0.50	72.70	1.7	FALSE	0.5	72.7	1.7	1.0	79	83	0.133	8580	5532	0.61	0.16	0.76	1.19	0.76	Yes	Yes	Yes
	70.00	-30.8	152.8	0.50	0.34	8708	6262	0.6	47	1.9	0.50	81.56	1.7	FALSE	0.5	81.6	1.7	1.1	89	94	0.157	8592	5538	0.60	0.16	0.76	1.19	0.89	Yes	Yes	Yes
	70.20	-31.0	148.3	0.30	0.21	8732	6273	0.6	46	1.9	0.50	79.01	1.7	FALSE	0.5	79.0	1.7	1.0	86	87	0.142	8616	5550	0.60	0.16	0.76	1.19	0.81	Yes	Yes	Yes
	70.40	-31.2	143.1	0.30	0.22	8756	6285	0.6	44	1.9	0.50	76.08	1.7	FALSE	0.5	76.1	1.7	1.0	83	85	0.138	8640	5561	0.60	0.16	0.76	1.19	0.79	Yes	Yes	Yes
	70.50	-31.3	113.5	0.30	0.27	8768	6291	0.6	35	2.0	0.50	59.82	1.8	FALSE	0.5	59.8	1.8	1.1	66	74	0.117	8652	5567	0.60	0.16	0.76	1.19	0.67	Yes	Yes	Yes
	70.70	-31.5	106.9	0.20	0.20	8792	6302	0.6	33	2.0	0.50	56.14	1.8	FALSE	0.5	56.1	1.8	1.1	62	68	0.110	8676	5578	0.60	0.16	0.76	1.19	0.63	Yes	Yes	Yes
	70.90	-31.7	107.3	0.20	0.19	8816	6314	0.6	33	2.0	0.50	56.30	1.8	FALSE	0.5	56.3	1.8	1.1	62	68	0.110	8700	5590	0.60	0.16	0.76	1.19	0.63	Yes	Yes	Yes
	71.00	-31.8	105.1	0.20	0.20	8828	6320	0.6	32	2.0	0.50	55.07	1.8	FALSE	0.5	55.1	1.8	1.1	61	68	0.109	8712	5596	0.60	0.16	0.76	1.19	0.62	Yes	Yes	Yes
	71.20	-32.0	98.7	0.20	0.21	8852	6331	0.6	30	2.1	0.50	51.51	1.8	FALSE	0.5	51.5	1.8	1.1	57	65	0.105	8736	5607	0.59	0.16	0.76	1.19	0.61	Yes	Yes	Yes
	71.40	-32.2	104.9	0.20	0.20	8876	6343	0.6	32	2.0	0.50	54.85	1.8	FALSE	0.5	54.8	1.8	1.1	61	67	0.108	8760	5619	0.59	0.16	0.76	1.19	0.62	Yes	Yes	Yes
	71.50	-32.3	120.5	0.20	0.17	8888	6348	0.6	37	2.0	0.50	63.33	1.7	FALSE	0.5	63.3	1.7	1.1	70	74	0.117	8772	5624	0.59	0.16	0.76	1.19	0.67	Yes	Yes	Yes
	71.70	-32.5	134.7	0.10	0.08	8912	6360	0.6	41	1.9	0.50	71.01	1.6	FALSE	0.5	71.0	1.6	1.0	78	78	0.124	8796	5636	0.59	0.16	0.76	1.19	0.71	Yes	Yes	Yes
	71.90	-32.7	136.1	0.20	0.15	8936	6371	0.6	41	1.9	0.50	71.70	1.7	FALSE	0.5	71.7	1.7	1.0	78	79	0.127	8820	5648	0.59	0.16	0.76	1.19	0.73	Yes	Yes	Yes
	72.00	-32.8	136.6	0.20	0.15	8948	6377	0.6	41	1.9	0.50	71.94	1.7	FALSE	0.5	71.9	1.7	1.0	79	80	0.127	8832	5653	0.59	0.16	0.76	1.19	0.73	Yes	Yes	Yes
	72.20	-33.0	131.2	0.30	0.24	8972	6389	0.6	40	2.0	0.50	68.93	1.7	FALSE	0.5	68.9	1.7	1.1	76	80	0.128	8856	5665	0.59	0.16	0.76	1.19	0.74	Yes	Yes	Yes
	72.30	-33.1	124.1	0.30	0.25	8984	6394	0.6	37	2.0	0.50	65.03	1.8	FALSE	0.5	65.0	1.8	1.1	71	77	0.123	8868	5671	0.59	0.16	0.76	1.19	0.71	Yes	Yes	Yes
	72.50	-33.3	119.7	0.30	0.26	9008	6406	0.6	36	2.0	0.50	62.58	1.8	FALSE	0.5	62.6	1.8	1.1	69	76	0.120	8892	5682	0.58	0.16	0.76	1.19	0.70	Yes	Yes	Yes
	72.70	-33.5	117.9	0.30	0.26	9032	6417	0.6	35	2.0	0.50	61.54	1.8	FALSE	0.5	61.5	1.8	1.1	68	75	0.119	8916	5694	0.58	0.16	0.76	1.19	0.69	Yes	Yes	Yes
	72.80	-33.6	116.2	0.30	0.27	9044	6423	0.6	35	2.0	0.50	60.58	1.8	FALSE	0.5	60.6	1.8	1.1	67	74	0.118	8928	5699	0.58	0.16	0.76	1.19	0.69	Yes	Yes	Yes
	73.00	-33.8	109.8	0.30	0.28	9068	6435	0.6	33	2.1	0.50	57.06	1.8	FALSE	0.5	57.1	1.8	1.1	63	72	0.114	8952	5711	0.58	0.15	0.76	1.19	0.67	Yes	Yes	Yes
	73.20	-34.0	99.2	0.20	0.21	9092	6446	0.6	29	2.1	0.50	51.26	1.8	FALSE	0.5	51.3	1.8	1.1	57	65	0.105	8976	5722	0.58	0.15	0.76	1.19	0.62	Yes	Yes	Yes
	73.30	-34.1	86.2	0.20	0.24	9104	6452	0.6	25	2.2	0.50	44.19	1.9	FALSE	0.5	44.2	1.9	1.2	49	60	0.100	8988	5728	0.58	0.15	0.76	1.19	0.58	Yes	Yes	Yes
	73.50	-34.3	76.0	0.20	0.28	9128	6464	0.6	22	2.2	0.50	38.63	2.0	FALSE	0.5	38.6	2.0	1.3	43	56	0.097	9012	5740	0.58	0.15	0.76	1.19	0.57	Yes	Yes	Yes
	73.70	-34.5	69.6	0.10	0.15	9152	6475	0.6	20	2.2	0.50	35.13	2.0	FALSE	0.5	35.1	2.0	1.3	40	50	0.092	9036	5751	0.57	0.15	0.76	1.19	0.54	Yes	Yes	Yes
	73.80	-34.6	72.3	0.10	0.15	9164	6481	0.6	21	2.2	0.50	36.57	1.9	FALSE	0.5	36.6	1.9	1.2	41	51	0.092	9048	5757	0.57	0.15	0.76	1.19	0.54	Yes	Yes	Yes
	74.00	-34.8	79.9	0.20	0.27	9188	6492	0.6	23	2.2	0.50	40.64	2.0	FALSE	0.5	40.6	2.0	1.3	46	58	0.098	9072	5768	0.57	0.15	0.76	1.19	0.58	Yes	Yes	Yes
	74.10	-34.9	75.5	0.10	0.14	9200	6498	0.6	22	2.2	0.50	38.24	1.9	FALSE	0.5	38.2	1.9	1.2	43	52	0.093	9084	5774	0.57	0.15	0.76	1.19	0.55	Yes	Yes	Yes
	74.30	-35.1	72.9	0.20	0.29	9224	6510	0.6	21	2.3	0.50	36.80	2.0	FALSE	0.5	36.8	2.0	1.3	42	55	0.096	9108	5786	0.57	0.15	0.76	1.19	0.57	Yes	Yes	Yes
	74.50	-35.3	73.2	0.90	1.31	9248	6521	0.6	21	2.5	0.50	36.92	2.3	FALSE	0.5	36.9	2.3	2.0	42	85	0.137	9132	5797	0.57	0.15	0.75	1.19	0.81	Yes	Yes	Yes
	74.60	-35.4	87.4	0.60	0.72	9260	6527	0.6	25	2.3	0.50	44.54	2.1	FALSE	0.5	44.5	2.1	1.5	50	74	0.118	9144	5803	0.57	0.15	0.75	1.19	0.70	Yes	Yes	Yes
	74.80	-35.6	137.5	0.30	0.23	9284	6538	0.6	41	1.9	0.50	71.44	1.7	FALSE	0.5	71.4	1.7	1.0	78	82	0.131	9168	5815	0.57	0.15	0.75	1.19	0.78	Yes	Yes	Yes
	75.00	-35.8	149.4	0.50	0.35	9308	6550	0.6	44	2.0	0.50	77.76	1.8	FALSE	0.5	77.8	1.8	1.1	85	91	0.150	9192	5826	0.56	0.15	0.75	1.19	0.89	Yes	Yes	Yes
	75.10	-35.9	163.7	0.70	0.44	9320	6556	0.6	49	2.0	0.50	85.40	1.8	FALSE	0.5	85.4	1.8	1.1	93	101	0.175	9204	5832	0.56	0.15	0.75	1.19	1.04	Yes	Yes	Yes
	75.30	-36.1	154.4	0.40	0.27	9344	6567	0.6	46	1.9	0.50	80.33	1.7	FALSE	0.5	80.3	1.7	1.0	88	91	0.149	9228	5843	0.56	0.15	0.75	1.19	0.89	Yes	Yes	Yes
	75.50	-36.3	193.5	1.00	0.53	9368	6579	0.6	57	2.0	0.50	101.21	1.7	FALSE	0.5	101.2	1.7	1.1	110	117	0.229	9252	5855	0.56	0.15	0.75	1.19	1.37	Yes	Yes	Yes
	75.60	-36.4	264.7	1.40	0.54	9380	6584	0.6	79	1.8	0.50	139.32	1.6	FALSE	0.5	139.3	1.6	1.0	150	150	0.394	9264	5861	0.56	0.15	0.75	1.19	2.35	Yes	Yes	No
	75.80	-36.6	319.0	1.10	0.35	9404	6596	0.6	95	1.7	0.50	168.26	1.5	FALSE	0.5	168.3	1.5	1.0	181	181	0.600	9288	5872	0.56	0.15	0.75	1.19	3.57	Yes	Yes	No
	76.00	-36.8	302.1	0.80	0.27	9428	6608	0.6	90	1.6	0.50	159.06	1.4	FALSE	0.5	159.1	1.4	1.0	171	171	0.600	9312	5884	0.56	0.15	0.75	1.19	3.57	Yes	Yes	No
	76.10	-36.9	231.9	0.80	0.35	9440	6613	0.6	69	1.8	0.50	121.46	1.6	FALSE	0.5	121.5	1.6	1.0	131	131	0.290	9324	5889	0.56	0.15	0.75	1.19	1.72	Yes	Yes	No
	76.30	-37.1	215.1	0.70	0.33	9464	6625	0.6	64	1.8	0.50	112.37	1.6	FALSE	0.5	112.4	1.6	1.0	122	122	0.247	9348	5901	0.56	0.15	0.75	1.19	1.47	Yes	Yes	No
	76.40	-37.2	205.8	0.70	0.35	9476	6631	0.6	61	1.9	0.50	107.36	1.6	FALSE	0.5	107.4	1.6	1.0	116	116	0.226	9360	5907	0.56	0.15	0.75	1.19	1.34	Yes	Yes	Yes
	76.60	-37.4	204.6	1.00	0.50	9500	6642	0.6	60	1.9	0.50	106.62	1.7	FALSE	0.5	106.6	1.7	1.0	115	121	0.243	9384	5918	0.56	0.15	0.75	1.19	1.44	Yes	Yes	No
	76.80	-37.6	214.8	1.70	0.81	9524	6654	0.6	63	2.0	0.50	111.95	1.8	FALSE	0.5	112.0	1.8	1.1	121	135	0.311	9408	5930	0.56	0.15	0.75	1.19	1.84	Yes	Yes	No
	76.90	-37.7	244.3	2.20	0.92	9536	6659	0.6	72	2.0	0.50	127.62	1.8	FALSE	0.5	127.6	1.8	1.1	138	153	0.413	9420	5936	0.56	0.15	0.75	1.19	2.44	Yes	Yes	No
	77.10	-37.9	158.2	1.10	0.72	9560	6671	0.6	46	2.1	0.50	81.67	1.9	FALSE	0.5	81.7	1.9	1.2	89	105	0.189	9444	5947	0.56	0.15	0.75	1.19	1.12	Yes	Yes	Yes
	77.30	-38.1	140.3	0.20	0.15	9584	6682	0.6	41	1.9	0.50	72.07	1.7	FALSE	0.5	72.1	1.7	1.0	79	80	0.127	9468	5959	0.56	0.15	0.75	1.19	0.75	Yes	Yes	Yes
	77.40	-38.2	122.5	0.60	0.51	9596	6688	0.6	35	2.1	0.50	62.58	1.9	FALSE	0.5	62.6	1.9	1.2	69	83	0.133	9480	5964	0.56	0.15	0.75	1.19	0.78	Yes	Yes	Yes
	77.60	-38.4	127.8	0.50	0.41	9620	6700	0.6	37	2.1	0.50	65.33	1.9	FALSE	0.5	65.3	1.9	1.1	72	82	0.132	9504	5976	0.56	0.15	0.75	1.19	0.78	Yes	Yes	Yes
	77.80	-38.6	130.5	0.90	0.72	9644	6711	0.6	37	2.2	0.50	66.70	2.0	FALSE	0.5	66.7	2.0	1.3	73	92	0.153	9528	5987	0.56	0.15	0.75	1.19	0.90	Yes	Yes	Yes
	77.90	-38.7	161.3	0.50	0.32	9656	6717	0.6	47	1.9	0.50	83.01	1.7	FALSE	0.5	83.0	1.7	1.0	91	95	0.159	9540	5993	0.56	0.15	0.75	1.19	0.94	Yes	Yes	Yes
	78.10	-38.9	192.9	0.20	0.11	9680	6728	0.6	56	1.7	0.50	99.68	1.5	FALSE	0.5	99.7	1.5	1.0	108	108	0.198	9564	6005	0.56	0.15	0.75	1.19	1.16	Yes	Yes	Yes
	78.20	-39.0	211.4	1.10	0.53	9692	6734	0.6	61	1.9	0.50	109.44	1.7	FALSE	0.5	109.4	1.7	1.0	119	124	0.258	9576	6010	0.56	0.15	0.75	1.19	1.52	Yes	Yes	No
	78.40	-39.2	203.2	3.50	1.76	9716	6746	0.6	59	2.2	0.50	105.00	2.1	FALSE	0.5	105.0	2.1	1.4	114	158	0.448	9600	6022	0.56	0.15	0.75	1.19	2.63	Yes	Yes	No
	78.60	-39.4	197.0	2.20	1.15	9740	6757	0.6	57	2.1	0.50	101.62	1.9	FALSE	0.5	101.6	1.9	1.2	110	136	0.313	9624	6033	0.56	0.15	0.75	1.19	1.84	Yes	Yes	No
	78.70	-39.5	173.8	1.00	0.59	9752	6763	0.6	50	2.0	0.50	89.31	1.8	FALSE	0.5	89.3	1.8	1.1	97	109	0.199	9636	6039	0.56	0.15	0.75	1.19	1.17	Yes	Yes	Yes

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{vd} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
	78.90	-39.7	192.5	0.80	0.43	9776	6775	0.6	55	1.9	0.50	99.10	1.7	FALSE	0.5	99.1	1.7	1.0	108	112	0.210	9660	6051	0.56	0.15	0.75	1.19	1.23	Yes	Yes	Yes
	79.10	-39.9	114.4	0.60	0.55	9800	6786	0.6	32	2.2	0.50	57.79	2.0	FALSE	0.5	57.8	2.0	1.2	64	80	0.127	9684	6062	0.56	0.15	0.75	1.19	0.75	Yes	Yes	Yes
	79.20	-40.0	100.1	0.60	0.63	9812	6792	0.6	28	2.3	0.50	50.22	2.0	FALSE	0.5	50.2	2.0	1.4	56	76	0.121	9696	6068	0.56	0.15	0.75	1.19	0.71	Yes	Yes	Yes
	79.40	-40.2	87.4	0.30	0.36	9836	6803	0.6	24	2.2	0.50	43.48	2.0	FALSE	0.5	43.5	2.0	1.3	49	63	0.103	9720	6080	0.56	0.15	0.75	1.19	0.60	Yes	Yes	Yes
	79.60	-40.4	94.8	0.40	0.45	9860	6815	0.6	26	2.2	0.50	47.33	2.0	FALSE	0.5	47.3	2.0	1.3	53	68	0.110	9744	6091	0.56	0.15	0.75	1.19	0.64	Yes	Yes	Yes
	79.70	-40.5	106.4	0.50	0.49	9872	6821	0.6	30	2.2	0.50	53.42	2.0	FALSE	0.5	53.4	2.0	1.3	59	75	0.119	9756	6097	0.56	0.15	0.75	1.19	0.69	Yes	Yes	Yes
	79.90	-40.7	114.9	0.20	0.18	9896	6832	0.6	32	2.0	0.50	57.84	1.8	FALSE	0.5	57.8	1.8	1.1	64	70	0.111	9780	6108	0.56	0.15	0.75	1.19	0.65	Yes	Yes	Yes
	80.10	-40.9	120.6	0.20	0.17	9920	6844	0.6	34	2.0	0.50	60.78	1.7	FALSE	0.5	60.8	1.7	1.1	67	72	0.114	9804	6120	0.56	0.15	0.75	1.19	0.67	Yes	Yes	Yes
	80.20	-41.0	161.2	0.70	0.45	9932	6849	0.6	46	2.0	0.50	82.08	1.8	FALSE	0.5	82.1	1.8	1.1	90	98	0.168	9816	6126	0.56	0.15	0.75	1.19	0.98	Yes	Yes	Yes
	80.40	-41.2	220.2	0.30	0.14	9956	6861	0.6	63	1.7	0.50	112.97	1.5	FALSE	0.5	113.0	1.5	1.0	122	122	0.250	9840	6137	0.56	0.15	0.75	1.19	1.45	Yes	Yes	No
	80.50	-41.3	276.3	0.60	0.22	9968	6867	0.6	79	1.7	0.50	142.36	1.4	FALSE	0.5	142.4	1.4	1.0	153	153	0.416	9852	6143	0.56	0.15	0.75	1.19	2.41	Yes	Yes	No
	80.70	-41.5	318.3	2.50	0.80	9992	6878	0.6	91	1.9	0.50	164.25	1.7	FALSE	0.5	164.2	1.7	1.0	177	181	0.600	9876	6154	0.56	0.15	0.74	1.19	3.48	Yes	Yes	No
	80.90	-41.7	363.8	1.00	0.28	10016	6890	0.6	104	1.6	0.50	187.94	1.4	FALSE	0.5	187.9	1.4	1.0	202	202	0.600	9900	6166	0.56	0.15	0.74	1.19	3.48	Yes	Yes	No
	81.00	-41.8	361.9	0.90	0.25	10028	6896	0.6	104	1.6	0.50	186.86	1.4	FALSE	0.5	186.9	1.4	1.0	200	200	0.600	9912	6172	0.56	0.15	0.74	1.19	3.48	Yes	Yes	No
	81.20	-42.0	298.1	1.00	0.34	10052	6907	0.6	85	1.7	0.50	153.32	1.5	FALSE	0.5	153.3	1.5	1.0	165	165	0.600	9936	6183	0.56	0.15	0.74	1.19	3.47	Yes	Yes	No
	81.40	-42.2	294.7	1.00	0.35	10076	6919	0.6	84	1.7	0.50	151.41	1.5	FALSE	0.5	151.4	1.5	1.0	163	163	0.600	9960	6195	0.56	0.15	0.74	1.19	3.47	Yes	Yes	No
	81.50	-42.3	263.6	0.60	0.23	10088	6924	0.6	75	1.7	0.50	135.09	1.5	FALSE	0.5	135.1	1.5	1.0	146	146	0.368	9972	6200	0.56	0.15	0.74	1.19	2.13	Yes	Yes	No
	81.70	-42.5	223.8	0.40	0.18	10112	6936	0.6	63	1.7	0.50	114.20	1.5	FALSE	0.5	114.2	1.5	1.0	124	124	0.256	9996	6212	0.56	0.15	0.74	1.19	1.48	Yes	Yes	No
	81.90	-42.7	200.7	0.20	0.10	10136	6947	0.6	56	1.7	0.50	102.05	1.5	FALSE	0.5	102.0	1.5	1.0	111	111	0.206	10020	6224	0.56	0.15	0.74	1.19	1.19	Yes	Yes	Yes
	82.00	-42.8	179.6	0.20	0.11	10148	6953	0.6	50	1.8	0.50	91.00	1.5	FALSE	0.5	91.0	1.5	1.0	99	99	0.170	10032	6229	0.56	0.15	0.74	1.19	0.98	Yes	Yes	Yes
	82.20	-43.0	171.8	0.20	0.12	10172	6965	0.6	48	1.8	0.50	86.86	1.6	FALSE	0.5	86.9	1.6	1.0	95	95	0.159	10056	6241	0.56	0.15	0.74	1.19	0.92	Yes	Yes	Yes
	82.30	-43.1	169.5	0.20	0.12	10184	6970	0.6	47	1.8	0.50	85.62	1.6	FALSE	0.5	85.6	1.6	1.0	93	93	0.156	10068	6247	0.56	0.15	0.74	1.19	0.90	Yes	Yes	Yes
	82.50	-43.3	188.0	0.20	0.11	10208	6982	0.6	52	1.8	0.50	95.17	1.5	FALSE	0.5	95.2	1.5	1.0	103	103	0.183	10092	6258	0.56	0.15	0.74	1.19	1.05	Yes	Yes	Yes
	82.70	-43.5	194.8	0.20	0.11	10232	6993	0.6	54	1.8	0.50	98.62	1.5	FALSE	0.5	98.6	1.5	1.0	107	107	0.194	10116	6270	0.56	0.15	0.74	1.19	1.12	Yes	Yes	Yes
	82.80	-43.6	206.1	0.30	0.15	10244	6999	0.5	57	1.8	0.50	104.45	1.5	FALSE	0.5	104.4	1.5	1.0	113	113	0.215	10128	6275	0.56	0.15	0.74	1.19	1.24	Yes	Yes	Yes
	83.00	-43.8	219.3	0.30	0.14	10268	7011	0.5	61	1.7	0.50	111.21	1.5	FALSE	0.5	111.2	1.5	1.0	120	120	0.243	10152	6287	0.56	0.15	0.74	1.19	1.39	Yes	Yes	Yes
	83.20	-44.0	226.7	0.30	0.14	10292	7022	0.5	63	1.7	0.50	114.95	1.5	FALSE	0.5	115.0	1.5	1.0	124	124	0.259	10176	6298	0.56	0.15	0.74	1.19	1.49	Yes	Yes	No
	83.30	-44.1	244.2	0.30	0.13	10304	7028	0.5	68	1.7	0.50	123.98	1.4	FALSE	0.5	124.0	1.4	1.0	134	134	0.304	10188	6304	0.56	0.15	0.74	1.19	1.74	Yes	Yes	No
	83.50	-44.3	255.7	0.40	0.16	10328	7040	0.5	71	1.7	0.50	129.83	1.4	FALSE	0.5	129.8	1.4	1.0	140	140	0.336	10212	6316	0.56	0.15	0.74	1.19	1.93	Yes	Yes	No
	83.70	-44.5	270.9	0.50	0.19	10352	7051	0.5	75	1.7	0.50	137.59	1.4	FALSE	0.5	137.6	1.4	1.0	148	148	0.384	10236	6327	0.56	0.15	0.74	1.19	2.20	Yes	Yes	No
	83.80	-44.6	287.4	0.50	0.18	10364	7057	0.5	80	1.6	0.50	146.07	1.4	FALSE	0.5	146.1	1.4	1.0	157	157	0.442	10248	6333	0.56	0.15	0.74	1.19	2.53	Yes	Yes	No
	84.00	-44.8	287.2	0.30	0.11	10388	7068	0.5	80	1.6	0.50	145.84	1.3	FALSE	0.5	145.8	1.3	1.0	157	157	0.441	10272	6344	0.56	0.15	0.74	1.19	2.52	Yes	Yes	No
	84.20	-45.0	274.0	0.10	0.04	10412	7080	0.5	76	1.6	0.50	138.89	1.3	FALSE	0.5	138.9	1.3	1.0	150	150	0.393	10296	6356	0.56	0.15	0.74	1.19	2.24	Yes	Yes	No
	84.30	-45.1	268.1	0.20	0.08	10424	7086	0.5	74	1.6	0.50	135.79	1.4	FALSE	0.5	135.8	1.4	1.0	147	147	0.372	10308	6362	0.56	0.15	0.74	1.19	2.13	Yes	Yes	No
	84.50	-45.3	259.9	0.20	0.08	10448	7097	0.5	72	1.6	0.50	131.44	1.4	FALSE	0.5	131.4	1.4	1.0	142	142	0.346	10332	6373	0.56	0.15	0.74	1.19	1.97	Yes	Yes	No
	84.60	-45.4	249.7	0.90	0.37	10460	7103	0.5	69	1.8	0.50	126.12	1.6	FALSE	0.5	126.1	1.6	1.0	136	136	0.315	10344	6379	0.56	0.15	0.74	1.19	1.80	Yes	Yes	No
	84.80	-45.6	233.3	0.90	0.39	10484	7114	0.5	64	1.9	0.50	117.56	1.6	FALSE	0.5	117.6	1.6	1.0	127	127	0.272	10368	6391	0.56	0.15	0.74	1.19	1.55	Yes	Yes	No
	85.00	-45.8	178.2	1.30	0.75	10508	7126	0.5	49	2.1	0.50	89.08	1.9	FALSE	0.5	89.1	1.9	1.2	97	113	0.215	10392	6402	0.56	0.15	0.74	1.19	1.22	Yes	Yes	Yes
	85.10	-45.9	139.1	1.10	0.82	10520	7132	0.5	38	2.2	0.50	68.91	2.0	FALSE	0.5	68.9	2.0	1.3	76	97	0.166	10404	6408	0.56	0.15	0.74	1.19	0.94	Yes	Yes	Yes
	85.30	-46.1	121.0	0.90	0.78	10544	7143	0.5	32	2.3	0.50	59.53	2.0	FALSE	0.5	59.5	2.0	1.3	66	88	0.143	10428	6419	0.56	0.15	0.74	1.19	0.81	Yes	Yes	Yes
	85.50	-46.3	118.9	0.70	0.62	10568	7155	0.5	32	2.2	0.50	58.40	2.0	FALSE	0.5	58.4	2.0	1.3	65	82	0.132	10452	6431	0.56	0.15	0.74	1.19	0.75	Yes	Yes	Yes
	85.60	-46.4	123.4	0.50	0.42	10580	7160	0.5	33	2.1	0.50	60.69	1.9	FALSE	0.5	60.7	1.9	1.2	67	79	0.126	10464	6437	0.56	0.16	0.74	1.19	0.71	Yes	Yes	Yes
	85.80	-46.6	150.8	0.50	0.34	10604	7172	0.5	41	2.0	0.50	74.70	1.8	FALSE	0.5	74.7	1.8	1.1	82	89	0.145	10488	6448	0.56	0.16	0.74	1.19	0.82	Yes	Yes	Yes
	86.00	-46.8	233.3	0.50	0.22	10628	7184	0.5	63	1.8	0.50	116.95	1.5	FALSE	0.5	117.0	1.5	1.0	127	127	0.269	10512	6460	0.56	0.16	0.74	1.19	1.52	Yes	Yes	No
	86.10	-46.9	404.0	0.50	0.13	10640	7189	0.5	111	1.5	0.50	204.43	1.2	FALSE	0.5	204.4	1.2	1.0	219	219	0.600	10524	6465	0.56	0.16	0.74	1.19	3.40	Yes	Yes	No

Calculated By: _____
Date: _____
Checked By: _____
Date: _____

I Street Bridge Liquefaction Evaluation
Geotechnical Evaluation
Liquefaction Triggering Evaluation

Purpose: Evaluate susceptibility of sand-like soils to liquefaction.

Boring: **WM0004_015B** **West Embankment**

Method:
1) If no Atterberg limits are available for soil samples, the soil will be assumed to behave as sand-like. Note that silty clays with no Atterberg limits are included as sand-like.
2) For all soils assumed to behave as sand-like, compute $(N_1)_{60}$.
3) For potentially contractive sand-like soils [$(N_1)_{,60} < 30$], compute the factor of safety against pore pressure increase (Youd et al 2001).
4) If potentially contractive sand-like soils have a factor of safety ≤ 1.4, assume the soil is susceptible to liquefaction.

References:
1) Youd, T. L. et al. (2001). "Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils". J. Geotech. And Geoenv. Engrg., ASCE, 127(4):297-313.

Assumed:

Ground Surface Elevation at Time of Drilling (ft)	39.2	Ground surface elevation taken from boring log
Ground Surface Elevation at Time for Design (ft)	39.2	Assume same ground surface for evaluation
Unit Wt. of soil 1 (pcf)	120	Assumed unit weight above the groundwater table
Unit Wt. of soil 2 (pcf)	130	Assumed unit weight below the groundwater table
Earthquake Magnitude (M_w)	7.0	Magnitude is assumed based off previous WSAFCA Study
Earthquake PGA (g)	0.262	Assumed based off previous WSAFCA Study
Elevation of Groundwater at Time of Drilling (ft)	9.1	Value reported in log of Boring 123 in FSAR Appendix I
Elevation of Groundwater at Time for Design (ft)	20.0	Assumed to be at ground surface for design
Depth to Groundwater at Time of Drilling (ft)	30.1	Calculated from Groundwater Table Elevation at Drilling (above cell)
Depth to Groundwater for Design (ft)	19.2	Calculated from Groundwater Table Elevation at Design (above cell)
Length of Drilling Rod above the Ground Surface (ft)	5.0	Assumed

Corrections for hammer energy, borehole diameter, rod length, and sampling method (Ref. 1, Table 2):

Factor	Term	Equipment Variable	Correction
Energy Ratio	C_E	Energy ratio = 83.9%	1.4
Borehole Diameter	C_B	Diameter < 115 mm (assumed)	1.05
Sampling Method	C_S	Sampler without Liner (assumed)	1.0
Rod Length	C_R	0 ≤ d ≤ 3 m	0.75
		3 < d ≤ 4 m	0.80
		4 < d ≤ 6 m	0.85
		6 < d ≤ 10 m	0.95
		d > 10 m	1.00

Youd et al 2001 Eqn. No.	Equation
8, 10	$(N_1)_{60} = Nm * C_N * C_E * C_B * C_S * C_R$ where $C_N = 2.2/[1.2 + (\sigma'_{v0,a}/P_a)]$ and P_a = 2116 psf (= 101 kPa)
5	$(N_1)_{60cs} = \alpha + \beta(N_1)_{60}$ where: α=0 for FC≤5%, $\alpha=\exp[1.76 - 190/(FC)^2]$ for 5%<FC<35%, α=5 for FC≥35%; β=1 for FC≤5%, $\beta=[0.99 + (FC)^{1.5}/1000]$ for 5%<FC<35%, β=1.2 for FC≥35%
4	$CRR_{7.5} = 1/[34-(N_1)_{60cs}] + (N_1)_{60cs} / 135 + 50 / [10(N_1)_{60cs} + 45]^2 - 1/200$ for $(N_1)_{60cs} < 30$
1	$CSR = \tau_{av} / \sigma'_{v0,b} = 0.65 (a_{max}/g)(\sigma_{v0,b}/\sigma'_{v0,b})r_d$
2	$r_d = (1.0 - 0.00765*z)$ for z ≤ 9.15m and $r_d = (1.174 - 0.0267*z)$ for 9.15m < z ≤ 23m, where z is the depth below the design ground surface
24	$MSF = 10^{2.24} / Mw^{2.56}$
31	$K_\sigma = [\sigma'_{v0,b} / P_a]^{(f-1)}$ where f = 0.75 for an assumed relative density of 50%
30	$FS_L = (CRR_{7.5} / CSR) * MSF * K_\sigma$

Calculated By: _____
Date: _____
Checked By: _____
Date: _____

Notes:

1) = cell which is input by the user (cells not highlighted are computed by Excel).
2) N_m = Uncorrected blowcounts measured in the field.
3) FC = measured fines content (% passing the No. 200 sieve) and PI = measured plasticity index.
4) $\sigma'_{v0,a}$ is the vertical effective stress computed using the depth to water at the time of drilling.
5) $\sigma_{v0,b}$ is the total vertical stress for design.
6) $\sigma'_{v0,b}$ is the vertical effective stress computed using the depth to water for design.
7) In the absense of laboratory fines contents, an estimate of the fines content is made based on the field soil description: SP-SM = 5% Fines, Silty or Clayey = 12% Fines, Clays or Silts = 50% Fines.
8) Samples with $(N_1)_{60cs}$ > 30 are considered non-liquefiable and are screened out of the analysis, per Youd et al. (2001). Samples may also be screened out of the analysis for other reasons, which shall be described in the Notes column.
9) The depth reduction factor r_d, as defined in Youd et al. (2001), is only provided for soils shallower than 23 meters. r_d values at samples deeper than 23 meters at design are conservatively assigned an r_d value corresponding to a depth of 23 meters.

Sample ID.	Elev. (ft)	Depth at Drilling (ft)	N_m	Soil Type	FC (%)	Est. FC (%)	PI (%)	$\sigma'_{v0,a}$ (tsf)	C_N	C_E	C_B	C_S	C_R	$(N_1)_{60}$	Analysis Fines Content (%)	$(N_1)_{60cs}$	$CRR_{M7.5}$ at σ'_{v0}=1 atm	Depth at Design (ft)	$\sigma_{v0,b}$ (tsf)	$\sigma'_{v0,b}$ (tsf)	r_d	CSR	MSF	K_σ	Below Analysis Water El?	Screened out of Analysis?	FS_L	Notes
			Note 2		Note 3	Note 7	Note 3	Note 4							Note 7		Note 8		Note 5	Note 6	Note 9					Note 8		
WM0004_015B	34.2	5.0	3	SP-SM	7.6	7.6		0.30	1.5	1.4	1.05	1.00	0.80	5	8	5	0.08	5.00	0.30	0.30	0.99	0.17	1.19	1.0	No		0.5	
WM0004_015B	29.2	10.0	6	SP-SM	7.7	7.7		0.60	1.2	1.4	1.05	1.00	0.85	9	8	10	0.11	10.00	0.60	0.60	0.98	0.17	1.19	1.0	No		0.8	
WM0004_015B	22.7	16.5	8	CL		50.0		0.99	1.0	1.4	1.05	1.00	0.95	12	50	19	0.20	16.50	0.99	0.99	0.96	0.16	1.19	1.0	No	Y	100.0	
WM0004_015B	19.2	20.0	6	CL	66.8	50.0		1.20	0.9	1.4	1.05	1.00	0.95	8	67	14	0.15	20.00	1.20	1.18	0.95	0.17	1.19	1.0	Yes	Y	100.0	
WM0004_015B	14.2	25.0	9	SM		12.0		1.50	0.8	1.4	1.05	1.00	0.95	11	12	12	0.14	25.00	1.53	1.35	0.94	0.18	1.19	0.9	Yes		0.8	
WM0004_015B	9.2	30.0	9	SM		12.0		1.80	0.8	1.4	1.05	1.00	1.00	10	12	12	0.13	30.00	1.85	1.52	0.93	0.19	1.19	0.9	Yes		0.7	
WM0004_015B	4.2	35.0	9	ML		50.0		1.97	0.7	1.4	1.05	1.00	1.00	10	50	16	0.17	35.00	2.18	1.68	0.89	0.20	1.19	0.9	Yes		0.9	
WM0004_015B	-0.9	40.0	19	SP-SM	10.2	10.2		2.14	0.7	1.4	1.05	1.00	1.00	19	10	20	0.22	40.00	2.50	1.85	0.85	0.20	1.19	0.9	Yes		1.2	
WM0004_015B	-5.9	45.0	25	SP-SM	7.8	7.8		2.31	0.7	1.4	1.05	1.00	1.00	24	8	24	0.28	45.00	2.83	2.02	0.81	0.19	1.19	0.9	Yes		1.5	
WM0004_015B	-10.9	50.0	20	SP-SM	6.9	6.9		2.48	0.6	1.4	1.05	1.00	1.00	18	7	19	0.20	50.00	3.15	2.19	0.77	0.19	1.19	0.8	Yes		1.0	
WM0004_015B	-15.9	55.0	19	SP-SM	9.1	9.1		2.65	0.6	1.4	1.05	1.00	1.00	17	9	17	0.19	55.00	3.48	2.36	0.73	0.18	1.19	0.8	Yes		1.0	
WM0004_015B	-20.9	60.0	23	SP-SM	8.9	8.9		2.82	0.6	1.4	1.05	1.00	1.00	19	9	20	0.22	60.00	3.80	2.53	0.69	0.18	1.19	0.8	Yes		1.2	
WM0004_015B	-25.9	65.0	18	SP-SM	5.4	5.4		2.98	0.5	1.4	1.05	1.00	1.00	14	5	15	0.16	65.00	4.13	2.70	0.65	0.17	1.19	0.8	Yes		0.9	
WM0004_015B	-30.9	70.0	30	SP-SM	5.9	5.9		3.15	0.5	1.4	1.05	1.00	1.00	23	6	23	0.26	70.00	4.45	2.87	0.60	0.16	1.19	0.8	Yes		1.5	
WM0004_015B	-35.9	75.0	52	SP-SM		5.0		3.32	0.5	1.4	1.05	1.00	1.00	39	5	39	N/A	75.00	4.78	3.04	0.56	0.15	1.19	0.8	Yes	Y	100.0	
WM0004_015B	-40.9	80.0	45	SP-SM		5.0		3.49	0.5	1.4	1.05	1.00	1.00	32	5	32	N/A	80.00	5.10	3.21	0.56	0.15	1.19	0.8	Yes	Y	100.0	
WM0004_015B	-45.9	85.0	68	GW		5.0		3.66	0.5	1.4	1.05	1.00	1.00	47	5	47	N/A	85.00	5.43	3.37	0.56	0.15	1.19	0.7	Yes	Y	100.0	
WM0004_015B	-54.9	94.0	100	GW		5.0		3.96	0.4	1.4	1.05	1.00	1.00	65	5	65	N/A	94.00	6.01	3.68	0.56	0.16	1.19	0.7	Yes	Y	100.0	
WM0004_015B	-60.9	100.0	57	SW-SM	11.2	11.2		4.17	0.4	1.4	1.05	1.00	1.00	36	11	38	N/A	100.00	6.40	3.88	0.56	0.16	1.19	0.7	Yes	Y	100.0	
WM0004_015B	-65.9	105.0	53	CH		50.0		4.34	0.4	1.4	1.05	1.00	1.00	32	50	44	N/A	105.00	6.73	4.05	0.56	0.16	1.19	0.7	Yes	Y	100.0	
WM0004_015B	-70.9	110.0	36	CL		50.0		4.51	0.4	1.4	1.05	1.00	1.00	21	50	31	N/A	110.00	7.05	4.22	0.56	0.16	1.19	0.7	Yes	Y	100.0	

Project: I Street Bridge Replacement
Client: Mark Thomas and Company
Subject: EQ Analysis - I Street Bridge

Factors of Safety against Liquefaction
WM0004_0015C - I Street Bridge, Sacramento

Purpose: Evaluate susceptibility of sand-like soils to liquefaction.

Method: Use the "simplified procedure" practice for evaluating liquefaction of resistance of soils based on CPT results. The equations are based on the technical update presented in Reference 1 and are listed at the end of the spreadsheet.

References:
1) Youd, T. L. et al. (2001). "Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils". J. Geotech. and Geoenv. Engrg., ASCE, 127(4):297-313.

Assumptions:

Unit Wt. of Sand, Silt & Gravel above GWT, γ [pcf]	130.0	Assumed value based on coarser-grained units close to the ground surface
Unit Wt. of Sand, Silt & Gravel below GWT, γ [pcf]	120.0	Assumed value based on finer-grained units further from the ground surface
Earthquake magnitude	7	Magnitude is assumed based off previous WSAFCA Study
Depth to Groundwater at Time of Drilling (ft)	30.2	
Depth to Groundwater for Design (ft)	19.32	
Ground Surface Elevation	39.32	Ground Surface Elevation Listed on CPT log
Earthquake PGA (g)	0.262	

Youd et al 2001 Eqn. No.	Equation
12, 13	$q_{c1N} = C_Q(q_c/p_{atm})$ where $C_Q = (p_{atm}/\sigma'_{vo})^n$
18, 19	$q_{c1Ncs} = K_c q_{c1N}$ where $K_c = -0.403I_c^4 + 5.581I_c^3 - 21.63I_c^2 + 33.75I_c - 17.88$ for $I_c > 1.64$; $K_c = 1.0$ for $I_c <= 1.64$
11a,b	$CRR_{7.5} = 0.833(q_{c1Ncs}/1000) + 0.05$ for $q_{c1Ncs} < 50$; $93(q_{c1Ncs}/1000)^3 + 0.08$ for $50 \le q_{c1Ncs} < 160$; 0.60 for $q_{c1Ncs} \ge 160$
1	$CSR = \tau_{av} / \sigma'_{vo,b} = 0.65\,(a_{max}/g)(\sigma_{o,t,b}/\sigma'_{vo,b})r_d$
24	$MSF = 10^{2.24} / Mw^{2.56}$
31	$K_\sigma = [(\sigma'_{vo})_b / P_a]^{(f-1)}$ where f = 0.75 for an assumed relative density of 50%
30	$FS = (CRR_{7.5} / CSR) * MSF * K_\sigma$

Notes:
1) = cell which is input by the user (cells not highlighted are computed by Excel).
2) Qt1 is the normalized cone tip resistance for an exponent n equal to 1.0. This is also equal to the conventional normalized tip resistance, Q, as has been previously used (e.g. Robertson 1990).
3) Ic (n=1) indicates that the soil behavior type index Ic is calculated by assuming n is equal to 1.0. Ic is defined in equation 14 of Youd et al. 2001.
4) $(\sigma'_{vo})_a$ is the vertical effective stress computed using the depth to water at the time of drilling.
5) $(\sigma'_{vo})_b$ is the vertical effective sress computed using the depth to water during the earthquake.
6) If Ic (n=1) is less than 2.6 and the updated Ic (column Q) is greater than 2.6, set n to 0.7 and recalculate Qtn and Ic
7)
8) Ic < 2.6 is the nominal range of liquefiable soils, per the Robertson and Wride (1998) method.
9) Data points with Ic > 2.6 are included in the triggering evaluations if the exponent n is manually set to 0.7 to be consistent with SPT or laboratory classification of soils.

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																											Kσ	MSF				
							Note 4		Note 2	Note 3				Note 6									Note 5							Note 8		Note 9
	5.10	34.2	30.7	0.20	0.66	663	663	1.7	92	1.8	0.50	51.28	2.0	FALSE	0.5	51.3	2.0	1.4	52	71	0.113	663	663	0.99	0.17	1.00	1.19	0.80	Yes	No	No
	5.20	34.1	29.3	0.20	0.69	676	676	1.7	86	1.9	0.50	48.43	2.1	FALSE	0.5	48.4	2.1	1.4	50	70	0.112	676	676	0.99	0.17	1.00	1.19	0.80	Yes	No	No
	5.40	33.9	27.6	0.20	0.73	702	702	1.7	78	1.9	0.50	44.72	2.1	FALSE	0.5	44.7	2.1	1.5	47	70	0.112	702	702	0.99	0.17	1.00	1.19	0.79	Yes	No	No
	5.60	33.7	24.7	0.20	0.82	728	728	1.7	67	2.0	0.50	39.22	2.2	FALSE	0.5	39.2	2.2	1.6	42	69	0.111	728	728	0.99	0.17	1.00	1.19	0.79	Yes	No	No
	5.70	33.6	24.2	0.20	0.84	741	741	1.7	64	2.0	0.50	38.06	2.2	FALSE	0.5	38.1	2.2	1.7	41	69	0.111	741	741	0.99	0.17	1.00	1.19	0.79	Yes	No	No
	5.90	33.4	23.2	0.20	0.88	767	767	1.7	59	2.1	0.50	35.82	2.2	FALSE	0.5	35.8	2.2	1.8	39	68	0.110	767	767	0.99	0.17	1.00	1.19	0.78	Yes	No	No
	6.10	33.2	22.1	0.20	0.92	793	793	1.6	55	2.1	0.50	33.51	2.3	FALSE	0.5	33.5	2.3	1.9	36	68	0.109	793	793	0.99	0.17	1.00	1.19	0.77	Yes	No	No
	6.20	33.1	21.2	0.20	0.96	806	806	1.6	52	2.1	0.50	31.85	2.3	FALSE	0.5	31.8	2.3	2.0	34	68	0.109	806	806	0.99	0.17	1.00	1.19	0.77	Yes	No	No
	6.40	32.9	20.5	0.10	0.50	832	832	1.6	48	2.0	0.50	30.27	2.2	FALSE	0.5	30.3	2.2	1.6	33	54	0.094	832	832	0.99	0.17	1.00	1.19	0.67	Yes	No	No
	6.60	32.7	20.0	0.10	0.51	858	858	1.6	46	2.0	0.50	29.05	2.2	FALSE	0.5	29.0	2.2	1.7	31	53	0.094	858	858	0.98	0.17	1.00	1.19	0.67	Yes	No	No
	6.70	32.6	19.3	0.10	0.53	871	871	1.6	43	2.1	0.50	27.79	2.2	FALSE	0.5	27.8	2.2	1.8	30	53	0.094	871	871	0.98	0.17	1.00	1.19	0.67	Yes	No	No
	6.90	32.4	18.2	0.10	0.56	897	897	1.5	40	2.1	0.50	25.77	2.3	FALSE	0.5	25.8	2.3	1.9	28	52	0.093	897	897	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	7.10	32.2	18.4	0.10	0.56	923	923	1.5	39	2.1	0.50	25.67	2.3	FALSE	0.5	25.7	2.3	1.9	28	52	0.093	923	923	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	7.20	32.1	18.2	0.10	0.56	936	936	1.5	38	2.1	0.50	25.20	2.3	FALSE	0.5	25.2	2.3	1.9	27	52	0.093	936	936	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	7.40	31.9	18.9	0.10	0.54	962	962	1.5	38	2.1	0.50	25.82	2.3	FALSE	0.5	25.8	2.3	1.9	28	52	0.093	962	962	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	7.50	31.8	18.6	0.10	0.55	975	975	1.5	37	2.1	0.50	25.22	2.3	FALSE	0.5	25.2	2.3	1.9	27	52	0.093	975	975	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	7.70	31.6	18.0	0.10	0.57	1001	1001	1.5	35	2.2	0.50	24.05	2.3	FALSE	0.5	24.0	2.3	2.0	26	52	0.093	1001	1001	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	7.90	31.4	17.9	0.10	0.58	1027	1027	1.4	34	2.2	0.50	23.59	2.3	FALSE	0.5	23.6	2.3	2.0	26	51	0.093	1027	1027	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	8.00	31.3	18.6	0.10	0.55	1040	1040	1.4	35	2.2	0.50	24.38	2.3	FALSE	0.5	24.4	2.3	1.9	27	51	0.093	1040	1040	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	8.20	31.1	18.7	0.10	0.55	1066	1066	1.4	34	2.2	0.50	24.19	2.3	FALSE	0.5	24.2	2.3	1.9	26	51	0.092	1066	1066	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	8.40	30.9	18.7	0.10	0.55	1092	1092	1.4	33	2.2	0.50	23.89	2.3	FALSE	0.5	23.9	2.3	2.0	26	51	0.092	1092	1092	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	8.50	30.8	19.3	0.10	0.53	1105	1105	1.4	34	2.2	0.50	24.52	2.3	FALSE	0.5	24.5	2.3	1.9	27	51	0.092	1105	1105	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	8.70	30.6	19.2	0.10	0.54	1131	1131	1.4	33	2.2	0.50	24.09	2.3	FALSE	0.5	24.1	2.3	1.9	26	51	0.092	1131	1131	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	8.90	30.4	17.4	0.10	0.59	1157	1157	1.4	29	2.2	0.50	21.50	2.4	FALSE	0.5	21.5	2.4	2.1	24	51	0.092	1157	1157	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	9.00	30.3	16.0	0.10	0.65	1170	1170	1.3	26	2.3	0.50	19.59	2.4	FALSE	0.5	19.6	2.4	2.4	22	51	0.092	1170	1170	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	9.20	30.1	14.1	0.10	0.74	1196	1196	1.3	23	2.4	0.50	16.97	2.5	FALSE	0.5	17.0	2.5	2.7	19	51	0.092	1196	1196	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	9.40	29.9	12.7	0.10	0.83	1222	1222	1.3	20	2.5	0.50	15.04	2.6	FALSE	0.5	15.0	2.6	3.1	17	52	0.093	1222	1222	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	9.50	29.8	13.7	0.10	0.76	1235	1235	1.3	21	2.4	0.50	16.19	2.5	FALSE	0.5	16.2	2.5	2.8	18	51	0.092	1235	1235	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	9.70	29.6	15.5	0.10	0.67	1261	1261	1.3	24	2.3	0.50	18.21	2.4	FALSE	0.5	18.2	2.4	2.5	20	50	0.092	1261	1261	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	9.80	29.5	18.9	0.10	0.55	1274	1274	1.3	29	2.2	0.50	22.25	2.3	FALSE	0.5	22.2	2.3	2.0	24	50	0.092	1274	1274	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	10.00	29.3	21.5	0.20	0.96	1300	1300	1.3	32	2.3	0.50	25.14	2.4	FALSE	0.5	25.1	2.4	2.3	27	63	0.103	1300	1300	0.98	0.17	1.00	1.19	0.74	Yes	No	No
	10.20	29.1	24.3	0.20	0.85	1326	1326	1.3	36	2.2	0.50	28.22	2.3	FALSE	0.5	28.2	2.3	2.0	31	62	0.102	1326	1326	0.98	0.17	1.00	1.19	0.73	Yes	No	No
	10.30	29.0	25.6	0.20	0.80	1339	1339	1.3	37	2.2	0.50	29.62	2.3	FALSE	0.5	29.6	2.3	1.9	32	62	0.102	1339	1339	0.98	0.17	1.00	1.19	0.73	Yes	No	No
	10.50	28.8	26.6	0.30	1.16	1365	1365	1.2	38	2.3	0.50	30.50	2.4	FALSE	0.5	30.5	2.4	2.2	33	72	0.115	1365	1365	0.98	0.17	1.00	1.19	0.82	Yes	No	No
	10.70	28.6	28.8	0.20	0.71	1391	1391	1.2	40	2.1	0.50	32.76	2.2	FALSE	0.5	32.8	2.2	1.7	36	62	0.102	1391	1391	0.98	0.17	1.00	1.19	0.73	Yes	No	No
	10.80	28.5	31.4	0.20	0.65	1404	1404	1.2	44	2.1	0.50	35.62	2.2	FALSE	0.5	35.6	2.2	1.6	39	62	0.103	1404	1404	0.97	0.17	1.00	1.19	0.74	Yes	No	No
	11.00	28.3	32.6	0.20	0.63	1430	1430	1.2	45	2.1	0.50	36.66	2.2	FALSE	0.5	36.7	2.2	1.6	40	62	0.103	1430	1430	0.97	0.17	1.00	1.19	0.74	Yes	No	No
	11.20	28.1	32.0	0.20	0.64	1456	1456	1.2	43	2.1	0.50	35.63	2.2	FALSE	0.5	35.6	2.2	1.6	39	62	0.102	1456	1456	0.97	0.17	1.00	1.19	0.74	Yes	No	No
	11.30	28.0	30.5	0.20	0.67	1469	1469	1.2	41	2.1	0.50	33.77	2.2	FALSE	0.5	33.8	2.2	1.7	37	62	0.102	1469	1469	0.97	0.17	1.00	1.19	0.73	Yes	No	No
	11.50	27.8	28.7	0.20	0.72	1495	1495	1.2	37	2.2	0.50	31.43	2.2	FALSE	0.5	31.4	2.2	1.8	34	61	0.101	1495	1495	0.97	0.17	1.00	1.19	0.73	Yes	No	No
	11.60	27.7	27.4	0.20	0.75	1508	1508	1.2	35	2.2	0.50	29.83	2.3	FALSE	0.5	29.8	2.3	1.9	32	61	0.101	1508	1508	0.97	0.17	1.00	1.19	0.73	Yes	No	No
	11.80	27.5	27.0	0.20	0.76	1534	1534	1.2	34	2.2	0.50	29.12	2.3	FALSE	0.5	29.1	2.3	1.9	32	61	0.101	1534	1534	0.97	0.17	1.00	1.19	0.73	Yes	No	No
	12.00	27.3	27.6	0.20	0.75	1560	1560	1.2	34	2.2	0.50	29.52	2.3	FALSE	0.5	29.5	2.3	1.9	32	61	0.101	1560	1560	0.97	0.17	1.00	1.19	0.72	Yes	No	No
	12.10	27.2	27.4	0.20	0.75	1573	1573	1.2	34	2.2	0.50	29.17	2.3	FALSE	0.5	29.2	2.3	1.9	32	60	0.101	1573	1573	0.97	0.17	1.00	1.19	0.72	Yes	No	No
	12.30	27.0	27.3	0.20	0.75	1599	1599	1.2	33	2.2	0.50	28.81	2.3	FALSE	0.5	28.8	2.3	1.9	31	60	0.100	1599	1599	0.97	0.17	1.00	1.19	0.72	Yes	No	No
	12.50	26.8	28.0	0.20	0.74	1625	1625	1.1	33	2.2	0.50	29.32	2.3	FALSE	0.5	29.3	2.3	1.9	32	60	0.100	1625	1625	0.97	0.17	1.00	1.19	0.72	Yes	No	No
	12.60	26.7	28.7	0.20	0.72	1638	1638	1.1	34	2.2	0.50	29.95	2.3	FALSE	0.5	30.0	2.3	1.8	33	60	0.100	1638	1638	0.97	0.17	1.00	1.19	0.72	Yes	No	No
	12.80	26.5	29.3	0.20	0.70	1664	1664	1.1	34	2.2	0.50	30.34	2.3	FALSE	0.5	30.3	2.3	1.8	33	60	0.100	1664	1664	0.97	0.17	1.00	1.19	0.72	Yes	No	No
	13.00	26.3	29.4	0.10	0.35	1690	1690	1.1	34	2.1	0.50	30.20	2.1	FALSE	0.5	30.2	2.1	1.5	33	50	0.092	1690	1690	0.97	0.17	1.00	1.19	0.66	Yes	No	No
	13.10	26.2	29.8	0.10	0.35	1703	1703	1.1	34	2.1	0.50	30.50	2.1	FALSE	0.5	30.5	2.1	1.5	33	50	0.092	1703	1703	0.97	0.17	1.00	1.19	0.66	Yes	No	No
	13.30	26.0	28.1	0.20	0.73	1729	1729	1.1	32	2.3	0.50	28.48	2.3	FALSE	0.5	28.5	2.3	1.9	31	60	0.100	1729	1729	0.97	0.17	1.00	1.19	0.72	Yes	No	No
	13.50	25.8	27.8	0.20	0.74	1755	1755	1.1	31	2.3	0.50	27.94	2.3	FALSE	0.5	27.9	2.3	1.9	31	59	0.099	1755	1755	0.97	0.16	1.00	1.19	0.72	Yes	No	No
	13.60	25.7	29.1	0.20	0.71	1768	1768	1.1	32	2.2	0.50	29.18	2.3	FALSE	0.5	29.2	2.3	1.9	32	59	0.099	1768	1768	0.97	0.16	1.00	1.19	0.72	Yes	No	No
	13.80	25.5	30.3	0.20	0.68	1794	1794	1.1	33	2.2	0.50	30.18	2.3	FALSE	0.5	30.2	2.3	1.8	33	59	0.099	1794	1794	0.97	0.16	1.00	1.19	0.72	Yes	No	No
	13.90	25.4	32.4	0.20	0.63	1807	1807	1.1	35	2.2	0.50	32.21	2.2	FALSE	0.5	32.2	2.2	1.7	35	60	0.100	1807	1807	0.97	0.16	1.00	1.19	0.72	Yes	No	No
	14.10	25.2	34.9	0.20	0.59	1833	1833	1.1	37	2.1	0.50	34.51	2.2	FALSE	0.5	34.5	2.2	1.6	37	60	0.100	1833	1833	0.97	0.16	1.00	1.19	0.72	Yes	No	No
	14.30	25.0	39.1	0.20	0.52	1859	1859	1.1	41	2.1	0.50	38.49	2.1	FALSE	0.5	38.5	2.1	1.5	42	61	0.101	1859	1859	0.97	0.16	1.00	1.19	0.73	Yes	No	No
	14.40	24.9	40.3	0.30	0.76	1872	1872	1.1	42	2.2	0.50	39.56	2.2	FALSE	0.5	39.6	2.2	1.6	43	69	0.110	1872	1872	0.97	0.16	1.00	1.19	0.80	Yes	No	No
	14.60	24.7	37.7	0.30	0.82	1898	1898	1.1	39	2.2	0.50	36.68	2.2	FALSE	0.5	36.7	2.2	1.7	40	68	0.109	1898	1898	0.97	0.16	1.00	1.19	0.79	Yes	No	No
	14.80	24.5	37.0	0.30	0.83	1924	1924	1.0	37	2.2	0.50	35.72	2.2	FALSE	0.5	35.7	2.2	1.7	39	68	0.109	1924	1924	0.97	0.16	1.00	1.19	0.79	Yes	No	No
	14.90	24.4	35.4	0.40	1.16	1937	1937	1.0	36	2.3	0.50	34.01	2.3	FALSE	0.5	34.0	2.3	2.0	37	75	0.120	1937	1937	0.97	0.16	1.00	1.19	0.87	Yes	No	No
	15.10	24.2	34.7	0.40	1.19	1963	1963	1.0	34	2.3	0.50	33.09	2.3	FALSE	0.5	33.1	2.3	2.1	36	75	0.119	1963	1963	0.96	0.16	1.00	1.19	0.87	Yes	No	No
	15.30	24.0	34.6	0.50	1.49	1989	1989	1.0	34	2.4	0.50	32.76	2.4	FALSE	0.5	32.8	2.4	2.3	36	83	0.132	1989	1989	0.96	0.16	1.00	1.19	0.96	Yes	No	No
	15.40	23.9	36.8	0.40	1.12	2002	2002	1.0	36	2.3	0.50	34.79	2.3	FALSE	0.5	34.8	2.3	2.0	38	75	0.119	2002	2002	0.96	0.16	1.00	1.19	0.86	Yes	No	No
WM0004_015C	15.60	23.7	40.8	0.40	1.01	2028	2028	1.0	39	2.2	0.50	38.41	2.2	FALSE	0.5	38.4	2.2	1.8	42	75	0.119	2028	2028	0.96	0.16	1.00	1.19	0.86	Yes	No	No
	15.70	23.6	38.2	0.40	1.08	2041	2041	1.0	36	2.3	0.50	35.78	2.3	FALSE	0.5	35.8	2.3	1.9	39	74	0.118	2041	2041	0.96	0.16	1.00	1.19	0.86	Yes	No	No
	15.90	23.4	36.4	0.40	1.13	2067	2067	1.0	34	2.3	0.50	33.82	2.3	FALSE	0.5	33.8	2.3	2.0	37	74	0.118	2067	2067	0.96	0.16	1.00	1.19	0.86	Yes	No	No
	16.10	23.2	35.6	0.60	1.74	2093	2093	1.0	33	2.4	0.50	32.84	2.4	FALSE	0.5	32.8	2.4	2.5	36	89	0.145	2093	2093	0.96	0.16	1.00	1.19	1.05	Yes	No	No
	16.20	23.1	37.5	0.70	1.92	2106	2106	1.0	35	2.4	0.50	34.53	2.4	FALSE	0.5	34.5	2.4	2.5	38	95	0.159	2106	2106	0.96	0.16	1.00	1.19	1.16	Yes	No	No
	16.40	22.9	38.6	0.80	2.13	2132	2132	1.0	35	2.5	0.50	35.34	2.5	FALSE	0.5	35.3	2.5	2.6	38	100	0.174	2132	2132	0.96	0.16	1.00	1.19	1.27	Yes	No	No
	16.60	22.7	50.2	0.90	1.83	2158	2158	1.0	46	2.3	0.50	45.97	2.3	FALSE	0.5	46.0	2.3	2.1	50	103	0.182	2158	2158	0.96	0.16	1.00	1.19	1.32	Yes	No	No
	16.70	22.6	62.5	1.00	1.63	2171	2171	1.0	57	2.2	0.50	57.31	2.2	FALSE	0.5	57.3	2.2	1.7	62	108	0.197	2171	2171	0.96	0.16	0.99	1.19	1.42	Yes	No	No
	16.90	22.4	64.6	1.20	1.89	2197	2197	1.0	58	2.3	0.50	58.90	2.3	FALSE	0.5	58.9	2.3	1.8	63	117	0.228	2197	2197	0.96	0.16	0.99	1.19	1.64	Yes	No	No
	17.10	22.2	57.6	1.20	2.12	2223	2223	1.0	51	2.3	0.50	52.09	2.3	FALSE	0.5	52.1	2.3	2.1	56	117	0.228	2223	2223	0.96	0.16	0.99	1.19	1.64	Yes	No	No
	17.20	22.1	52.8	1.20	2.32	2236	2236	1.0	46	2.4	0.50	47.52	2.4	FALSE	0.5	47.5	2.4	2.3	51	117	0.231	2236	2236	0.96	0.16	0.99	1.19	1.66	Yes	No	No
	17.40	21.9	45.6	1.10	2.47	2262	2262	1.0	39	2.5	0.50	40.65	2.5	FALSE	0.5	40.7	2.5	2.6	44	114	0.218	2262	2262	0.96	0.16	0.98	1.19	1.57	Yes	No	No
	17.60	21.7	43.4	0.90	2.13	2288	2288	1.0	37	2.5	0.50	38.41	2.4	FALSE	0.5	38.4	2.4	2.5	42	104	0.183	2288	2288	0.96	0.16	0.98	1.19	1.31	Yes	No	No
	17.70	21.6	41.9	0.90	2.21	2301	2301	1.0	35	2.5	0.50	36.93	2.5	FALSE	0.5	36.9	2.5	2.6	40	104	0.185	2301	2301	0.96	0.16	0.98	1.19	1.32	Yes	No	No
	17.90	21.4	42.5	0.90	2.18	2327	2327	1.0	36	2.5	0.50	37.26	2.5	FALSE	0.5	37.3	2.5	2.6	41	104	0.183	2327	2327	0.96	0.16	0.98	1.19	1.31	Yes	No	No
	18.00	21.3	45.3	1.10	2.49	2340	2340	1.0	38	2.5	0.50	39.66	2.5	FALSE	0.5	39.7	2.5	2.6	43	114	0.216	2340	2340	0.96	0.16	0.98	1.19	1.54	Yes	No	No
	18.20	21.1	36.2	1.30	3.71	2366	2366	0.9	30	2.7	1.00	29.60	2.7	FALSE	1.0	29.6	2.7	3.9	32	125		2366	2366	0.96	0.16	0.97	1.19	100.00	No	No	No
	18.40	20.9	28.5	1.30	4.76	2392	2392	0.9	23	2.8	1.00	22.83	2.8	FALSE	1.0	22.8	2.8	5.1	25	129		2392	2392	0.96	0.16	0.97	1.19	100.00	No	No	No

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{vd} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
	18.50	20.8	19.6	1.00	5.44	2405	2405	0.9	15	3.0	1.00	15.30	3.0	FALSE	1.0	15.3	3.0	6.8	17	118		2405	2405	0.96	0.16	0.97	1.19	100.00	No	No	No
	18.70	20.6	15.1	0.70	5.04	2431	2431	0.9	11	3.1	1.00	11.42	3.1	FALSE	1.0	11.4	3.1	7.7	13	102		2431	2431	0.96	0.16	0.97	1.19	100.00	No	No	No
	18.90	20.4	14.9	0.50	3.66	2457	2457	0.9	11	3.0	1.00	11.13	3.0	FALSE	1.0	11.1	3.0	6.8	13	88		2457	2457	0.96	0.16	0.96	1.19	100.00	No	No	No
	19.00	20.3	28.9	0.60	2.17	2470	2470	0.9	22	2.6	1.00	22.40	2.6	FALSE	1.0	22.4	2.6	3.5	25	87		2470	2470	0.96	0.16	0.96	1.19	100.00	No	No	No
	19.20	20.1	33.6	0.70	2.16	2496	2496	0.9	26	2.6	0.50	28.15	2.5	FALSE	0.5	28.2	2.5	3.0	31	94	0.157	2496	2496	0.96	0.16	0.96	1.19	1.10	Yes	No	No
	19.40	19.9	34.7	0.80	2.39	2522	2522	0.9	27	2.6	0.50	28.95	2.6	FALSE	0.5	29.0	2.6	3.1	32	100	0.172	2521	2517	0.95	0.16	0.96	1.19	1.20	Yes	Yes	Yes
	19.50	19.8	31.3	0.60	2.00	2535	2535	0.9	24	2.6	0.50	25.93	2.6	FALSE	0.5	25.9	2.6	3.1	29	88	0.143	2533	2524	0.95	0.16	0.96	1.19	1.00	Yes	Yes	Yes
	19.70	19.6	22.4	0.60	2.84	2561	2561	0.8	16	2.8	1.00	16.49	2.8	FALSE	1.0	16.5	2.8	4.8	19	90		2557	2537	0.95	0.16	0.95	1.19	100.00	No	Yes	No
	19.80	19.5	16.5	0.60	3.94	2574	2574	0.8	12	3.0	1.00	11.82	3.0	FALSE	1.0	11.8	3.0	6.8	14	93		2569	2544	0.95	0.16	0.95	1.19	100.00	No	Yes	No
	20.00	19.3	15.4	0.50	3.55	2600	2600	0.8	11	3.0	1.00	10.85	3.0	FALSE	1.0	10.8	3.0	6.9	13	86		2593	2558	0.95	0.16	0.95	1.19	100.00	No	Yes	No
	20.20	19.1	15.4	0.50	3.55	2626	2626	0.8	11	3.0	1.00	10.73	3.0	FALSE	1.0	10.7	3.0	6.9	12	86		2617	2571	0.95	0.17	0.95	1.19	100.00	No	Yes	No
	20.30	19.0	14.9	0.50	3.68	2639	2639	0.8	10	3.0	1.00	10.29	3.0	FALSE	1.0	10.3	3.0	7.2	12	86		2629	2578	0.95	0.17	0.95	1.19	100.00	No	Yes	No
	20.50	18.8	29.0	0.50	1.81	2665	2665	0.8	21	2.6	1.00	20.76	2.6	FALSE	1.0	20.8	2.6	3.4	23	78		2653	2591	0.95	0.17	0.94	1.19	100.00	No	Yes	No
	20.70	18.6	34.7	0.60	1.80	2691	2691	0.9	25	2.5	0.50	27.96	2.5	FALSE	0.5	28.0	2.5	2.8	31	86	0.139	2677	2605	0.95	0.17	0.94	1.19	0.94	Yes	Yes	Yes
	20.80	18.5	35.1	0.60	1.78	2704	2704	0.9	25	2.5	0.50	28.22	2.5	FALSE	0.5	28.2	2.5	2.8	31	86	0.138	2689	2612	0.95	0.17	0.94	1.19	0.93	Yes	Yes	Yes
	21.00	18.3	33.1	0.60	1.89	2730	2730	0.9	23	2.6	0.50	26.41	2.5	FALSE	0.5	26.4	2.5	3.0	29	86	0.140	2713	2625	0.95	0.17	0.94	1.19	0.93	Yes	Yes	Yes
	21.20	18.1	31.5	0.60	1.99	2756	2756	0.8	22	2.6	1.00	21.86	2.6	FALSE	1.0	21.9	2.6	3.4	24	83		2737	2639	0.95	0.17	0.94	1.19	100.00	No	Yes	No
	21.30	18.0	31.6	0.60	1.99	2769	2769	0.8	22	2.6	1.00	21.82	2.6	FALSE	1.0	21.8	2.6	3.4	24	83		2749	2645	0.95	0.17	0.93	1.19	100.00	No	Yes	No
	21.50	17.8	30.1	0.60	2.09	2795	2795	0.8	21	2.7	1.00	20.54	2.7	FALSE	1.0	20.5	2.7	3.7	23	83		2773	2659	0.95	0.17	0.93	1.19	100.00	No	Yes	No
	21.70	17.6	25.6	0.80	3.31	2821	2821	0.8	17	2.8	1.00	17.15	2.8	FALSE	1.0	17.1	2.8	5.1	19	97		2797	2672	0.95	0.17	0.93	1.19	100.00	No	Yes	No
	21.80	17.5	18.7	0.70	4.05	2834	2834	0.7	12	3.0	1.00	12.20	3.0	FALSE	1.0	12.2	3.0	6.8	14	95		2809	2679	0.95	0.17	0.93	1.19	100.00	No	Yes	No
	22.00	17.3	13.7	0.50	4.07	2860	2860	0.7	9	3.1	1.00	8.58	3.1	FALSE	1.0	8.6	3.1	8.3	10	84		2833	2693	0.95	0.17	0.93	1.19	100.00	No	Yes	No
	22.10	17.2	12.6	0.50	4.48	2873	2873	0.7	8	3.2	1.00	7.77	3.2	FALSE	1.0	7.8	3.2	9.1	9	84		2845	2700	0.95	0.17	0.93	1.19	100.00	No	Yes	No
	22.30	17.0	22.2	0.70	3.37	2899	2899	0.7	14	2.9	1.00	14.32	2.9	FALSE	1.0	14.3	2.9	5.7	16	92		2869	2713	0.95	0.17	0.92	1.19	100.00	No	Yes	No
	22.50	16.8	33.6	0.90	2.80	2925	2925	0.7	22	2.7	1.00	21.97	2.7	FALSE	1.0	22.0	2.7	4.0	24	98		2893	2727	0.95	0.17	0.92	1.19	100.00	No	Yes	No
	22.60	16.7	30.1	1.10	3.84	2938	2938	0.7	19	2.8	1.00	19.49	2.8	FALSE	1.0	19.5	2.8	5.0	22	109		2905	2733	0.95	0.17	0.92	1.19	100.00	No	Yes	No
	22.80	16.5	19.0	0.70	4.00	2964	2964	0.7	12	3.0	1.00	11.82	3.0	FALSE	1.0	11.8	3.0	6.9	14	93		2929	2747	0.95	0.17	0.92	1.19	100.00	No	Yes	No
	23.00	16.3	17.7	0.80	4.94	2990	2990	0.7	11	3.1	1.00	10.84	3.1	FALSE	1.0	10.8	3.1	7.9	13	99		2953	2760	0.95	0.17	0.92	1.19	100.00	No	Yes	No
	23.10	16.2	49.3	1.30	2.72	3003	3003	0.8	32	2.6	0.50	37.92	2.5	FALSE	0.5	37.9	2.5	2.8	41	117	0.230	2965	2767	0.95	0.17	0.92	1.19	1.46	Yes	Yes	No
	23.30	16.0	49.5	1.60	3.33	3029	3029	0.7	32	2.6	1.00	31.68	2.6	FALSE	1.0	31.7	2.6	3.5	35	122		2989	2781	0.95	0.17	0.91	1.19	100.00	No	Yes	No
	23.50	15.8	42.6	1.50	3.65	3055	3055	0.7	27	2.7	1.00	26.89	2.7	FALSE	1.0	26.9	2.7	4.1	30	120		3013	2794	0.95	0.17	0.91	1.19	100.00	No	Yes	No
	23.60	15.7	35.9	1.20	3.49	3068	3068	0.7	22	2.8	1.00	22.40	2.8	FALSE	1.0	22.4	2.8	4.4	25	110		3025	2801	0.94	0.17	0.91	1.19	100.00	No	Yes	No
	23.80	15.5	29.7	0.90	3.20	3094	3094	0.7	18	2.8	1.00	18.20	2.8	FALSE	1.0	18.2	2.8	4.8	20	98		3049	2814	0.94	0.17	0.91	1.19	100.00	No	Yes	No
	24.00	15.3	26.7	0.90	3.58	3120	3120	0.7	16	2.9	1.00	16.12	2.9	FALSE	1.0	16.1	2.9	5.5	18	99		3073	2828	0.94	0.17	0.91	1.19	100.00	No	Yes	No
	24.10	15.2	26.5	0.90	3.61	3133	3133	0.7	16	2.9	1.00	15.92	2.9	FALSE	1.0	15.9	2.9	5.5	18	99		3085	2835	0.94	0.17	0.91	1.19	100.00	No	Yes	No
	24.30	15.0	46.8	0.90	1.99	3159	3159	0.8	29	2.5	0.50	34.98	2.5	FALSE	0.5	35.0	2.5	2.5	38	97	0.166	3109	2848	0.94	0.18	0.90	1.19	1.02	Yes	Yes	Yes
	24.40	14.9	58.4	0.90	1.58	3172	3172	0.8	36	2.4	0.50	43.86	2.3	FALSE	0.5	43.9	2.3	2.0	48	95	0.160	3121	2855	0.94	0.18	0.90	1.19	0.98	Yes	Yes	Yes
	24.60	14.7	53.7	0.80	1.54	3198	3198	0.8	33	2.4	0.50	40.06	2.3	FALSE	0.5	40.1	2.3	2.1	44	91	0.149	3145	2869	0.94	0.18	0.90	1.19	0.91	Yes	Yes	Yes
	24.80	14.5	52.5	0.80	1.57	3224	3224	0.8	32	2.4	0.50	38.97	2.4	FALSE	0.5	39.0	2.4	2.1	43	91	0.149	3169	2882	0.94	0.18	0.90	1.19	0.91	Yes	Yes	Yes
	24.90	14.4	58.2	0.80	1.41	3237	3237	0.8	35	2.4	0.50	43.24	2.3	FALSE	0.5	43.2	2.3	1.9	47	90	0.148	3181	2889	0.94	0.18	0.90	1.19	0.90	Yes	Yes	Yes
	25.10	14.2	54.2	0.80	1.52	3263	3263	0.8	32	2.4	0.50	40.01	2.3	FALSE	0.5	40.0	2.3	2.1	44	90	0.148	3205	2902	0.94	0.18	0.90	1.19	0.90	Yes	Yes	Yes
	25.30	14.0	44.3	0.70	1.64	3289	3289	0.8	26	2.5	0.50	32.34	2.4	FALSE	0.5	32.3	2.4	2.4	36	87	0.140	3229	2916	0.94	0.18	0.90	1.19	0.84	Yes	Yes	Yes
	25.40	13.9	37.9	0.70	1.93	3302	3302	0.6	22	2.6	1.00	21.96	2.6	FALSE	1.0	22.0	2.6	3.4	24	82		3241	2923	0.94	0.18	0.89	1.19	100.00	No	Yes	No
	25.60	13.7	37.3	0.80	2.24	3328	3328	0.6	21	2.7	1.00	21.42	2.7	FALSE	1.0	21.4	2.7	3.7	24	87		3265	2936	0.94	0.18	0.89	1.19	100.00	No	Yes	No
	25.80	13.5	40.2	0.80	2.08	3354	3354	0.6	23	2.6	1.00	22.97	2.6	FALSE	1.0	23.0	2.6	3.4	25	86		3289	2950	0.94	0.18	0.89	1.19	100.00	No	Yes	No
	25.90	13.4	34.2	0.50	1.54	3367	3367	0.8	19	2.6	0.50	24.36	2.5	FALSE	0.5	24.4	2.5	2.8	27	77	0.122	3301	2956	0.94	0.18	0.89	1.19	0.73	Yes	Yes	Yes
	26.10	13.2	41.9	0.60	1.49	3393	3393	0.8	24	2.5	0.50	30.01	2.4	FALSE	0.5	30.0	2.4	2.4	33	81	0.129	3325	2970	0.94	0.18	0.89	1.19	0.77	Yes	Yes	Yes
	26.20	13.1	46.3	0.60	1.35	3406	3406	0.8	26	2.5	0.50	33.22	2.4	FALSE	0.5	33.2	2.4	2.2	36	80	0.128	3337	2977	0.94	0.18	0.89	1.19	0.75	Yes	Yes	Yes
	26.40	12.9	54.1	0.70	1.34	3432	3432	0.8	31	2.4	0.50	38.88	2.3	FALSE	0.5	38.9	2.3	2.0	42	84	0.136	3361	2990	0.94	0.18	0.89	1.19	0.80	Yes	Yes	Yes
	26.60	12.7	56.5	0.80	1.46	3458	3458	0.8	32	2.4	0.50	40.50	2.3	FALSE	0.5	40.5	2.3	2.0	44	89	0.146	3385	3004	0.94	0.18	0.88	1.19	0.86	Yes	Yes	Yes
	26.70	12.6	56.1	0.80	1.47	3471	3471	0.8	31	2.4	0.50	40.12	2.3	FALSE	0.5	40.1	2.3	2.0	44	89	0.146	3397	3010	0.94	0.18	0.88	1.19	0.85	Yes	Yes	Yes
	26.90	12.4	52.3	0.70	1.38	3497	3497	0.8	29	2.4	0.50	37.17	2.3	FALSE	0.5	37.2	2.3	2.1	41	84	0.136	3421	3024	0.94	0.18	0.88	1.19	0.79	Yes	Yes	Yes
	27.10	12.2	40.4	0.70	1.81	3523	3523	0.8	22	2.6	0.50	28.30	2.5	FALSE	0.5	28.3	2.5	2.8	31	87	0.141	3445	3038	0.94	0.18	0.88	1.19	0.82	Yes	Yes	Yes
	27.20	12.1	27.9	0.70	2.68	3536	3536	0.6	15	2.8	1.00	14.78	2.8	FALSE	1.0	14.8	2.8	5.0	17	84		3457	3044	0.94	0.18	0.88	1.19	100.00	No	Yes	No
	27.40	11.9	22.9	0.70	3.31	3562	3562	0.6	12	3.0	1.00	11.86	3.0	FALSE	1.0	11.9	3.0	6.3	14	86		3481	3058	0.94	0.18	0.88	1.19	100.00	No	Yes	No
	27.60	11.7	27.7	0.70	2.70	3588	3588	0.6	14	2.8	1.00	14.44	2.8	FALSE	1.0	14.4	2.8	5.1	16	84		3505	3071	0.94	0.18	0.88	1.19	100.00	No	Yes	No
	27.70	11.6	27.5	0.80	3.11	3601	3601	0.6	14	2.9	1.00	14.27	2.9	FALSE	1.0	14.3	2.9	5.5	16	89		3517	3078	0.94	0.18	0.88	1.19	100.00	No	Yes	No
	27.90	11.4	24.2	0.80	3.57	3627	3627	0.6	12	3.0	1.00	12.34	3.0	FALSE	1.0	12.3	3.0	6.4	14	90		3541	3092	0.93	0.18	0.87	1.19	100.00	No	Yes	No
	28.10	11.2	18.6	0.70	4.17	3653	3653	0.6	9	3.1	1.00	9.18	3.1	FALSE	1.0	9.2	3.1	8.1	11	87		3565	3105	0.93	0.18	0.87	1.19	100.00	No	Yes	No
	28.20	11.1	32.7	0.60	1.94	3666	3666	0.6	17	2.7	1.00	16.84	2.7	FALSE	1.0	16.8	2.7	4.0	19	76		3577	3112	0.93	0.18	0.87	1.19	100.00	No	Yes	No
	28.40	10.9	52.0	0.70	1.40	3692	3692	0.8	27	2.5	0.50	35.89	2.4	FALSE	0.5	35.9	2.4	2.1	39	84	0.134	3601	3125	0.93	0.18	0.87	1.19	0.76	Yes	Yes	Yes
	28.50	10.8	61.5	0.80	1.34	3705	3705	0.8	32	2.4	0.50	42.61	2.3	FALSE	0.5	42.6	2.3	1.9	46	88	0.143	3613	3132	0.93	0.18	0.87	1.19	0.81	Yes	Yes	Yes
	28.70	10.6	66.7	0.90	1.39	3731	3731	0.8	35	2.4	0.50	46.15	2.3	FALSE	0.5	46.1	2.3	1.8	50	92	0.153	3637	3146	0.93	0.18	0.87	1.19	0.86	Yes	Yes	Yes
	28.90	10.4	65.0	0.90	1.43	3757	3757	0.8	34	2.4	0.50	44.77	2.3	FALSE	0.5	44.8	2.3	1.9	49	92	0.152	3661	3159	0.93	0.18	0.87	1.19	0.86	Yes	Yes	Yes
	29.00	10.3	58.4	1.00	1.77	3770	3770	0.7	30	2.5	0.50	40.02	2.4	FALSE	0.5	40.0	2.4	2.2	44	97	0.165	3673	3166	0.93	0.18	0.87	1.19	0.92	Yes	Yes	Yes
	29.20	10.1	59.1	1.10	1.92	3796	3796	0.7	30	2.5	0.50	40.37	2.4	FALSE	0.5	40.4	2.4	2.3	44	101	0.176	3697	3179	0.93	0.18	0.86	1.19	0.98	Yes	Yes	Yes
	29.40	9.9	59.3	0.70	1.22	3822	3822	0.7	30	2.4	0.50	40.36	2.3	FALSE	0.5	40.4	2.3	1.9	44	83	0.133	3721	3193	0.93	0.18	0.86	1.19	0.74	Yes	Yes	Yes
	29.50	9.8	50.2	0.60	1.24	3835	3835	0.7	25	2.5	0.50	33.90	2.3	FALSE	0.5	33.9	2.3	2.1	37	78	0.124	3733	3200	0.93	0.19	0.86	1.19	0.69	Yes	Yes	Yes
	29.70	9.6	43.5	0.60	1.44	3861	3861	0.7	22	2.5	0.50	29.09	2.4	FALSE	0.5	29.1	2.4	2.5	32	79	0.126	3757	3213	0.93	0.19	0.86	1.19	0.70	Yes	Yes	Yes
	29.90	9.4	34.4	0.70	2.16	3887	3887	0.5	17	2.7	1.00	16.70	2.7	FALSE	1.0	16.7	2.7	4.2	19	79		3781	3227	0.93	0.19	0.86	1.19	100.00	No	Yes	No
	30.00	9.3	33.3	0.70	2.23	3900	3900	0.5	16	2.8	1.00	16.08	2.8	FALSE	1.0	16.1	2.8	4.4	18	80		3793	3234	0.93	0.19	0.86	1.19	100.00	No	Yes	No
	30.20	9.1	32.3	0.80	2.64	3926	3926	0.5	15	2.8	1.00	15.45	2.8	FALSE	1.0	15.5	2.8	4.9	17	85		3817	3247	0.93	0.19	0.86	1.19	100.00	No	Yes	No
	30.30	9.0	32.3	0.80	2.64	3938	3932	0.5	15	2.8	1.00	15.43	2.8	FALSE	1.0	15.4	2.8	4.9	17	85		3829	3253	0.93	0.19	0.86	1.19	100.00	No	Yes	No
	30.50	8.8	32.3	0.90	2.97	3962	3943	0.5	15	2.8	1.00	15.38	2.8	FALSE	1.0	15.4	2.8	5.2	17	89		3853	3264	0.93	0.19	0.86	1.19	100.00	No	Yes	No
	30.70	8.6	34.8	0.90	2.74	3986	3955	0.5	17	2.8	1.00	16.59	2.8	FALSE	1.0	16.6	2.8	4.7	19	88		3877	3276	0.92	0.19	0.86	1.19	100.00	No	Yes	No
	30.80	8.5	53.6	0.90	1.74	3998	3961	0.7	26	2.5	0.50	35.65	2.4	FALSE	0.5	35.6	2.4	2.4	39	92	0.153	3889	3282	0.92	0.19	0.85	1.19	0.84	Yes	Yes	Yes
	31.00	8.3	64.0	0.90	1.45	4022	3972	0.7	31	2.4	0.50	42.76	2.3	FALSE	0.5	42.8	2.3	1.9	47	91	0.150	3913	3293	0.92	0.19	0.85	1.19	0.82	Yes	Yes	Yes
	31.20	8.1	65.8	0.70	1.10	4046	3984	0.7	32	2.3	0.50	43.93	2.2	FALSE	0.5	43.9	2.2	1.7	48	82	0.132	3937	3305	0.92	0.19	0.85	1.19	0.72	Yes	Yes	Yes
	31.30	8.0	61.0	0.60	1.02	4058	3989	0.7	30	2.3	0.50	40.59	2.2	FALSE	0.5	40.6	2.2	1.7	44	77	0.123	3949	3310	0.92	0.19	0.85	1.19	0.67	Yes	Yes	Yes
	31.50	7.8	56.2	0.40	0.74	4082	4001	0.7	27	2.3	0.50	37.23	2.2	FALSE	0.5	37.2	2.2	1.6	41	67	0.108	3973	3322	0.92	0.19	0.85	1.19	0.59	Yes	Yes	Yes
	31.70	7.6	50.5	0.30	0.62	4106	4012	0.7	24	2.3	0.50	33.25	2.2	FALSE	0.5	33.3	2.2	1.7	37	61	0.101	3997	3333	0.92	0.19	0.85	1.19	0.55	Yes	Yes	Yes
	31.80	7.5	43.6	0.40	0.96	4118	4018	0.7	21	2.5	0.50	28.49	2.3	FALSE	0.5	28.5	2.3	2.1	32	67	0.108	4009	3339	0.92	0.19	0.85	1.19	0.58	Yes	Yes	Yes
	32.00	7.3	41.2	0.60	1.53	4142	4030	0.7	19	2.6	0.50	26.80	2.5	FALSE	0.5	26.8	2.5	2.7	30	80	0.127	4033	3351	0.91	0.19	0.85	1.19	0.69	Yes	Yes	Yes
	32.20	7.1	40.1	0.50	1.32	4166	4041	0.7	19	2.6	0.50	26.00	2.5	FALSE	0.5	26.0	2.5	2.5	29	74	0.117	4057	3362	0.91	0.19	0.85	1.19	0.63	Yes	Yes	Yes
	32.30	7.0	36.5	0.50	1.45	4178	4047	0.5	17	2.6	1.00	17.01	2.6	FALSE	1.0	17.0	2.6	3.5	19	67		4069	3368	0.91	0.19	0.85	1.19	100.00	No	Yes	No
	32.50	6.8	33.0	0.40	1.29	4202	4058	0.5	15	2.6	1.00	15.23	2.6	FALSE	1.0	15.2	2.6	3.6	17	62		4093	3380	0.91	0.19	0.85	1.19	100.00	No	Yes	No
	32.60	6.7	27.2	0.60	2.39	4214	4064	0.5	12	2.9	1.00	12.35	2.9	FALSE	1.0	12.3	2.9	5.4	14	76		4105	3385	0.91	0.19	0.85	1.19	100.00	No	Yes	No
	32.80	6.5	18.4	0.60	3.69	4238	4076	0.5	8	3.1	1.00	7.99	3.1	FALSE	1.0	8.0	3.1	8.3	10	79		4129	3397	0.91	0.19	0.85	1.19	100.00	No	Yes	No
	33.00	6.3	20.3	0.70	3.85	4262	4087	0.5	9	3.1	1.00	8.89	3.1	FALSE	1.0	8.9	3.1	7.9	11	83		4153	3408	0.91	0.19	0.85	1.19	100.00	No	Yes	No
	33.10	6.2	17.4	0.60	3.93	4274	4093	0.5	7	3.2	1.00	7.46	3.2	FALSE	1.0	7.5	3.2	8.8	9	79		4165	3414	0.90	0.19	0.85	1.19	100.00	No	Yes	No
	33.30	6.0	17.3	0.50	3.30	4298	4105	0.5	7	3.1	1.00	7.38	3.1	FALSE	1.0	7.4	3.1	8.3	9	74		4189	3426	0.90	0.19	0.85	1.19	100.00	No	Yes	No
	33.50	5.8	13.9	0.40	3.41	4322	4116	0.5	6	3.2	1.00	5.70	3.2	FALSE	1.0	5.7	3.2	9.7	7	69		4213	3437	0.90	0.19	0.85	1.19	100.00	No	Yes	No

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{vd} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
	33.60	5.7	13.5	0.30	2.65	4334	4122	0.5	5	3.2	1.00	5.50	3.2	FALSE	1.0	5.5	3.2	9.1	7	63		4225	3443	0.90	0.19	0.85	1.19	100.00	No	Yes	No
	33.80	5.5	12.8	0.40	3.77	4358	4133	0.5	5	3.3	1.00	5.14	3.3	FALSE	1.0	5.1	3.3	10.6	7	69		4249	3454	0.90	0.19	0.85	1.19	100.00	No	Yes	No
	34.00	5.3	17.7	0.30	1.93	4382	4145	0.5	7	3.0	1.00	7.48	3.0	FALSE	1.0	7.5	3.0	6.8	9	61		4273	3466	0.90	0.19	0.85	1.19	100.00	No	Yes	No
	34.10	5.2	36.2	0.40	1.18	4394	4151	0.7	16	2.6	0.50	22.95	2.5	FALSE	0.5	22.9	2.5	2.6	26	68	0.109	4285	3472	0.90	0.19	0.84	1.19	0.58	Yes	Yes	Yes
	34.30	5.0	33.1	0.50	1.62	4418	4162	0.5	15	2.7	1.00	14.84	2.7	FALSE	1.0	14.8	2.7	4.0	17	68		4309	3483	0.89	0.19	0.84	1.19	100.00	No	Yes	No
	34.40	4.9	32.5	0.60	1.98	4430	4168	0.5	15	2.8	1.00	14.53	2.8	FALSE	1.0	14.5	2.8	4.5	16	74		4321	3489	0.89	0.19	0.84	1.19	100.00	No	Yes	No
	34.60	4.7	31.5	0.70	2.39	4454	4179	0.5	14	2.8	1.00	14.01	2.8	FALSE	1.0	14.0	2.8	5.0	16	79		4345	3501	0.89	0.19	0.84	1.19	100.00	No	Yes	No
	34.80	4.5	32.8	0.60	1.96	4478	4191	0.5	15	2.8	1.00	14.58	2.8	FALSE	1.0	14.6	2.8	4.4	17	74		4369	3512	0.89	0.19	0.84	1.19	100.00	No	Yes	No
	34.90	4.4	39.3	0.40	1.08	4490	4197	0.7	18	2.6	0.50	24.87	2.4	FALSE	0.5	24.9	2.4	2.4	28	67	0.108	4381	3518	0.89	0.19	0.84	1.19	0.58	Yes	Yes	Yes
	35.10	4.2	39.6	0.40	1.07	4514	4208	0.7	18	2.5	0.50	25.03	2.4	FALSE	0.5	25.0	2.4	2.4	28	67	0.108	4405	3529	0.89	0.19	0.84	1.19	0.58	Yes	Yes	Yes
	35.30	4.0	37.7	0.40	1.13	4538	4220	0.7	17	2.6	0.50	23.71	2.5	FALSE	0.5	23.7	2.5	2.5	27	68	0.109	4429	3541	0.89	0.19	0.84	1.19	0.58	Yes	Yes	Yes
	35.40	3.9	35.8	0.40	1.19	4550	4226	0.5	16	2.6	1.00	15.87	2.6	FALSE	1.0	15.9	2.6	3.4	18	61		4441	3547	0.89	0.19	0.84	1.19	100.00	No	Yes	No
	35.60	3.7	35.7	0.40	1.20	4574	4237	0.5	16	2.6	1.00	15.77	2.6	FALSE	1.0	15.8	2.6	3.4	18	61		4465	3558	0.88	0.19	0.84	1.19	100.00	No	Yes	No
	35.80	3.5	36.0	0.30	0.89	4598	4249	0.7	16	2.6	0.50	22.48	2.4	FALSE	0.5	22.5	2.4	2.4	25	61	0.101	4489	3570	0.88	0.19	0.84	1.19	0.53	Yes	Yes	Yes
	35.90	3.4	34.4	0.30	0.93	4610	4254	0.7	15	2.6	0.50	21.39	2.4	FALSE	0.5	21.4	2.4	2.5	24	61	0.101	4501	3575	0.88	0.19	0.84	1.19	0.54	Yes	Yes	Yes
	36.10	3.2	25.2	0.40	1.75	4634	4266	0.5	11	2.8	1.00	10.73	2.8	FALSE	1.0	10.7	2.8	5.2	13	65		4525	3587	0.88	0.19	0.84	1.19	100.00	No	Yes	No
	36.30	3.0	17.1	0.50	3.39	4658	4277	0.5	7	3.2	1.00	6.91	3.2	FALSE	1.0	6.9	3.2	8.7	8	74		4549	3598	0.88	0.19	0.84	1.19	100.00	No	Yes	No
	36.40	2.9	18.2	0.50	3.15	4670	4283	0.5	7	3.1	1.00	7.41	3.1	FALSE	1.0	7.4	3.1	8.1	9	73		4561	3604	0.88	0.19	0.84	1.19	100.00	No	Yes	No
	36.60	2.7	22.2	0.50	2.52	4694	4295	0.5	9	3.0	1.00	9.25	3.0	FALSE	1.0	9.2	3.0	6.6	11	72		4585	3616	0.88	0.19	0.84	1.19	100.00	No	Yes	No
	36.70	2.6	26.1	0.50	2.11	4706	4300	0.5	11	2.9	1.00	11.04	2.9	FALSE	1.0	11.0	2.9	5.5	13	70		4597	3621	0.88	0.19	0.84	1.19	100.00	No	Yes	No
	36.90	2.4	29.8	0.40	1.46	4730	4312	0.5	13	2.7	1.00	12.73	2.7	FALSE	1.0	12.7	2.7	4.3	15	63		4621	3633	0.87	0.19	0.84	1.19	100.00	No	Yes	No
	37.10	2.2	30.3	0.20	0.72	4754	4323	0.7	13	2.6	0.50	18.46	2.5	FALSE	0.5	18.5	2.5	2.5	21	54	0.094	4645	3645	0.87	0.19	0.84	1.19	0.50	Yes	Yes	Yes
	37.20	2.1	31.2	0.20	0.69	4766	4329	0.7	13	2.6	0.50	19.04	2.4	FALSE	0.5	19.0	2.4	2.5	22	54	0.094	4657	3650	0.87	0.19	0.84	1.19	0.50	Yes	Yes	Yes
	37.40	1.9	28.6	0.20	0.76	4790	4341	0.5	12	2.6	1.00	12.07	2.6	FALSE	1.0	12.1	2.6	3.5	14	49		4681	3662	0.87	0.19	0.84	1.19	100.00	No	Yes	No
	37.60	1.7	22.8	0.30	1.47	4814	4352	0.5	9	2.9	1.00	9.37	2.9	FALSE	1.0	9.4	2.9	5.3	11	59		4705	3673	0.87	0.19	0.84	1.19	100.00	No	Yes	No
	37.70	1.6	18.2	0.30	1.90	4826	4358	0.5	7	3.0	1.00	7.25	3.0	FALSE	1.0	7.2	3.0	6.9	9	61		4717	3679	0.87	0.19	0.83	1.19	100.00	No	Yes	No
	37.90	1.4	11.7	0.30	3.23	4850	4370	0.5	4	3.3	1.00	4.25	3.3	FALSE	1.0	4.2	3.3	11.1	6	63		4741	3691	0.87	0.19	0.83	1.19	100.00	No	Yes	No
	38.10	1.2	9.2	0.30	4.44	4874	4381	0.5	3	3.5	1.00	3.09	3.5	FALSE	1.0	3.1	3.5	14.4	4	64		4765	3702	0.86	0.19	0.83	1.19	100.00	No	Yes	No
	38.20	1.1	8.1	0.20	3.54	4886	4387	0.5	3	3.5	1.00	2.58	3.5	FALSE	1.0	2.6	3.5	14.7	4	57		4777	3708	0.86	0.19	0.83	1.19	100.00	No	Yes	No
	38.40	0.9	9.3	0.20	2.92	4910	4398	0.5	3	3.4	1.00	3.11	3.4	FALSE	1.0	3.1	3.4	12.7	4	57		4801	3719	0.86	0.19	0.83	1.19	100.00	No	Yes	No
	38.60	0.7	7.9	0.20	3.68	4934	4410	0.5	2	3.6	1.00	2.46	3.6	FALSE	1.0	2.5	3.6	15.2	4	58		4825	3731	0.86	0.19	0.83	1.19	100.00	No	Yes	No
	38.70	0.6	9.1	0.30	4.53	4946	4416	0.5	3	3.5	1.00	3.00	3.5	FALSE	1.0	3.0	3.5	14.7	4	64		4837	3737	0.86	0.19	0.83	1.19	100.00	No	Yes	No
	38.90	0.4	16.1	0.30	2.20	4970	4427	0.5	6	3.1	1.00	6.15	3.1	FALSE	1.0	6.2	3.1	8.0	8	61		4861	3748	0.86	0.19	0.83	1.19	100.00	No	Yes	No
	39.00	0.3	13.1	0.40	3.77	4982	4433	0.5	5	3.3	1.00	4.79	3.3	FALSE	1.0	4.8	3.3	11.0	6	69		4873	3754	0.86	0.19	0.83	1.19	100.00	No	Yes	No
	39.20	0.1	13.1	0.50	4.72	5006	4444	0.5	5	3.4	1.00	4.77	3.4	FALSE	1.0	4.8	3.4	11.9	6	74		4897	3765	0.85	0.19	0.83	1.19	100.00	No	Yes	No
	39.40	-0.1	11.6	0.40	4.40	5030	4456	0.5	4	3.4	1.00	4.08	3.4	FALSE	1.0	4.1	3.4	12.6	6	69		4921	3777	0.85	0.19	0.83	1.19	100.00	No	Yes	No
	39.50	-0.2	8.7	0.30	4.86	5042	4462	0.5	3	3.6	1.00	2.77	3.6	FALSE	1.0	2.8	3.6	15.6	4	64		4933	3783	0.85	0.19	0.83	1.19	100.00	No	Yes	No
	39.70	-0.4	9.5	0.20	2.87	5066	4473	0.5	3	3.4	1.00	3.11	3.4	FALSE	1.0	3.1	3.4	12.6	4	57		4957	3794	0.85	0.19	0.83	1.19	100.00	No	Yes	No
	39.90	-0.6	6.5	0.20	5.06	5090	4485	0.5	2	3.8	1.00	1.76	3.8	FALSE	1.0	1.8	3.8	19.2	3	59		4981	3806	0.85	0.19	0.83	1.19	100.00	No	Yes	No
	40.00	-0.7	5.8	0.20	6.16	5102	4490	0.5	1	3.9	1.00	1.45	3.9	FALSE	1.0	1.4	3.9	21.9	3	60		4993	3812	0.85	0.19	0.83	1.19	100.00	No	Yes	No
	40.20	-0.9	12.6	0.10	1.00	5126	4502	0.5	4	3.1	1.00	4.46	3.1	FALSE	1.0	4.5	3.1	7.6	6	45		5017	3823	0.85	0.19	0.83	1.19	100.00	No	Yes	No
	40.40	-1.1	17.5	0.10	0.67	5150	4514	0.5	7	2.8	1.00	6.61	2.8	FALSE	1.0	6.6	2.8	5.2	8	43		5041	3835	0.85	0.19	0.83	1.19	100.00	No	Yes	No
	40.50	-1.2	16.9	0.10	0.70	5162	4519	0.5	6	2.9	1.00	6.34	2.9	FALSE	1.0	6.3	2.9	5.4	8	43		5053	3840	0.84	0.19	0.83	1.19	100.00	No	Yes	No
	40.70	-1.4	17.5	0.10	0.67	5186	4531	0.5	7	2.9	1.00	6.58	2.9	FALSE	1.0	6.6	2.9	5.2	8	43		5077	3852	0.84	0.19	0.83	1.19	100.00	No	Yes	No
	40.80	-1.5	18.2	0.10	0.64	5198	4537	0.5	7	2.8	1.00	6.88	2.8	FALSE	1.0	6.9	2.8	5.0	8	43		5089	3858	0.84	0.19	0.83	1.19	100.00	No	Yes	No
	41.00	-1.7	20.7	0.10	0.55	5222	4548	0.5	8	2.7	1.00	7.95	2.7	FALSE	1.0	8.0	2.7	4.3	10	42		5113	3869	0.84	0.19	0.83	1.19	100.00	No	Yes	No
	41.20	-1.9	21.7	0.10	0.52	5246	4560	0.5	8	2.7	1.00	8.37	2.7	FALSE	1.0	8.4	2.7	4.1	10	41		5137	3881	0.84	0.19	0.83	1.19	100.00	No	Yes	No
	41.30	-2.0	26.3	0.10	0.42	5258	4565	0.7	10	2.6	0.50	15.23	2.4	FALSE	0.5	15.2	2.4	2.5	18	44	0.087	5149	3886	0.84	0.19	0.83	1.19	0.45	Yes	Yes	Yes
	41.50	-2.2	28.9	0.10	0.38	5282	4577	0.7	11	2.5	0.50	16.88	2.4	FALSE	0.5	16.9	2.4	2.2	20	44	0.087	5173	3898	0.84	0.19	0.82	1.19	0.45	Yes	Yes	Yes
	41.70	-2.4	27.5	0.20	0.80	5306	4588	0.5	11	2.7	1.00	10.83	2.7	FALSE	1.0	10.8	2.7	3.9	13	49		5197	3909	0.83	0.19	0.82	1.19	100.00	No	Yes	No
	41.80	-2.5	24.3	0.20	0.92	5318	4594	0.5	9	2.8	1.00	9.42	2.8	FALSE	1.0	9.4	2.8	4.5	11	50		5209	3915	0.83	0.19	0.82	1.19	100.00	No	Yes	No
	42.00	-2.7	17.2	0.20	1.38	5342	4606	0.5	6	3.0	1.00	6.31	3.0	FALSE	1.0	6.3	3.0	6.7	8	53		5233	3927	0.83	0.19	0.82	1.19	100.00	No	Yes	No
	42.20	-2.9	11.7	0.30	3.33	5366	4617	0.5	4	3.4	1.00	3.91	3.4	FALSE	1.0	3.9	3.4	11.7	5	63		5257	3938	0.83	0.19	0.82	1.19	100.00	No	Yes	No
	42.30	-3.0	10.5	0.20	2.56	5378	4623	0.5	3	3.4	1.00	3.38	3.4	FALSE	1.0	3.4	3.4	11.7	5	56		5269	3944	0.83	0.19	0.82	1.19	100.00	No	Yes	No
	42.50	-3.2	15.7	0.20	1.54	5402	4634	0.5	6	3.1	1.00	5.61	3.1	FALSE	1.0	5.6	3.1	7.5	7	54		5293	3956	0.83	0.19	0.82	1.19	100.00	No	Yes	No
	42.70	-3.4	25.6	0.10	0.44	5426	4646	0.5	10	2.6	1.00	9.85	2.6	FALSE	1.0	9.9	2.6	3.5	12	40		5317	3967	0.83	0.19	0.82	1.19	100.00	No	Yes	No
	42.80	-3.5	33.2	0.10	0.33	5438	4652	0.7	13	2.5	0.50	19.43	2.3	FALSE	0.5	19.4	2.3	2.0	22	44	0.086	5329	3973	0.83	0.19	0.82	1.19	0.45	Yes	Yes	Yes
	43.00	-3.7	34.4	0.10	0.32	5462	4663	0.7	14	2.4	0.50	20.16	2.3	FALSE	0.5	20.2	2.3	1.9	23	44	0.087	5353	3984	0.82	0.19	0.82	1.19	0.45	Yes	Yes	Yes
	43.10	-3.8	33.8	0.10	0.32	5474	4669	0.7	13	2.5	0.50	19.77	2.3	FALSE	0.5	19.8	2.3	1.9	23	44	0.086	5365	3990	0.82	0.19	0.82	1.19	0.45	Yes	Yes	Yes
	43.30	-4.0	35.6	0.20	0.61	5498	4681	0.7	14	2.5	0.50	20.88	2.4	FALSE	0.5	20.9	2.4	2.2	24	53	0.094	5389	4002	0.82	0.19	0.82	1.19	0.49	Yes	Yes	Yes
	43.50	-4.2	38.4	0.20	0.56	5522	4692	0.7	15	2.5	0.50	22.62	2.3	FALSE	0.5	22.6	2.3	2.0	26	53	0.094	5413	4013	0.82	0.19	0.82	1.19	0.49	Yes	Yes	Yes
	43.60	-4.3	37.1	0.20	0.58	5534	4698	0.7	15	2.5	0.50	21.78	2.3	FALSE	0.5	21.8	2.3	2.1	25	53	0.094	5425	4019	0.82	0.19	0.82	1.19	0.49	Yes	Yes	Yes
	43.80	-4.5	38.7	0.20	0.56	5558	4709	0.7	15	2.5	0.50	22.76	2.3	FALSE	0.5	22.8	2.3	2.0	26	53	0.093	5449	4030	0.82	0.19	0.82	1.19	0.48	Yes	Yes	Yes
	44.00	-4.7	35.8	0.10	0.30	5582	4721	0.7	14	2.4	0.50	20.89	2.3	FALSE	0.5	20.9	2.3	1.8	24	44	0.087	5473	4042	0.82	0.19	0.82	1.19	0.45	Yes	Yes	Yes
	44.10	-4.8	35.4	0.10	0.31	5594	4727	0.7	14	2.4	0.50	20.62	2.3	FALSE	0.5	20.6	2.3	1.9	24	44	0.087	5485	4048	0.82	0.19	0.82	1.19	0.45	Yes	Yes	Yes
	44.30	-5.0	35.0	0.20	0.62	5618	4738	0.7	14	2.5	0.50	20.33	2.4	FALSE	0.5	20.3	2.4	2.3	23	53	0.094	5509	4059	0.81	0.19	0.82	1.19	0.49	Yes	Yes	Yes
	44.50	-5.2	33.9	0.10	0.32	5642	4750	0.7	13	2.5	0.50	19.61	2.3	FALSE	0.5	19.6	2.3	1.9	23	44	0.086	5533	4071	0.81	0.19	0.82	1.19	0.45	Yes	Yes	Yes
	44.60	-5.3	31.6	0.20	0.70	5654	4755	0.4	12	2.6	1.00	12.10	2.6	FALSE	1.0	12.1	2.6	3.4	14	48		5545	4077	0.81	0.19	0.82	1.19	100.00	No	Yes	No
	44.80	-5.5	27.5	0.10	0.41	5678	4767	0.7	10	2.6	0.50	15.53	2.4	FALSE	0.5	15.5	2.4	2.4	18	44	0.087	5569	4088	0.81	0.19	0.82	1.19	0.45	Yes	Yes	Yes
	44.90	-5.6	24.3	0.10	0.47	5690	4773	0.4	9	2.7	1.00	8.99	2.7	FALSE	1.0	9.0	2.7	3.8	11	41		5581	4094	0.81	0.19	0.82	1.19	100.00	No	Yes	No
	45.10	-5.8	24.0	0.10	0.47	5714	4784	0.4	9	2.7	1.00	8.84	2.7	FALSE	1.0	8.8	2.7	3.8	11	41		5605	4105	0.81	0.19	0.82	1.19	100.00	No	Yes	No
	45.30	-6.0	21.7	0.20	1.06	5738	4796	0.4	8	2.9	1.00	7.85	2.9	FALSE	1.0	7.9	2.9	5.3	10	51		5629	4117	0.81	0.19	0.82	1.19	100.00	No	Yes	No
	45.40	-6.1	18.9	0.20	1.25	5750	4802	0.4	7	3.0	1.00	6.67	3.0	FALSE	1.0	6.7	3.0	6.3	8	52		5641	4123	0.80	0.19	0.81	1.19	100.00	No	Yes	No
	45.60	-6.3	14.7	0.10	0.85	5774	4813	0.4	5	3.0	1.00	4.91	3.0	FALSE	1.0	4.9	3.0	6.8	6	44		5665	4134	0.80	0.19	0.81	1.19	100.00	No	Yes	No
	45.80	-6.5	20.7	0.10	0.56	5798	4825	0.4	7	2.8	1.00	7.38	2.8	FALSE	1.0	7.4	2.8	4.6	9	42		5689	4146	0.80	0.19	0.81	1.19	100.00	No	Yes	No
	45.90	-6.6	22.1	0.00	0.00	5810	4830	0.7	8	2.6	0.50	12.01	2.4	FALSE	0.5	12.0	2.4	2.3	15	34	0.078	5701	4151	0.80	0.19	0.81	1.19	0.41	Yes	Yes	Yes
	46.10	-6.8	21.9	0.10	0.53	5834	4842	0.4	8	2.7	1.00	7.84	2.7	FALSE	1.0	7.8	2.7	4.3	10	41		5725	4163	0.80	0.19	0.81	1.19	100.00	No	Yes	No
	46.30	-7.0	22.2	0.10	0.52	5858	4853	0.4	8	2.7	1.00	7.94	2.7	FALSE	1.0	7.9	2.7	4.3	10	41		5749	4174	0.80	0.19	0.81	1.19	100.00	No	Yes	No
	46.40	-7.1	23.1	0.10	0.50	5870	4859	0.4	8	2.7	1.00	8.30	2.7	FALSE	1.0	8.3	2.7	4.1	10	41		5761	4180	0.80	0.19	0.81	1.19	100.00	No	Yes	No
	46.60	-7.3	23.5	0.10	0.49	5894	4871	0.4	8	2.7	1.00	8.44	2.7	FALSE	1.0	8.4	2.7	4.0	10	41		5785	4192	0.79	0.19	0.81	1.19	100.00	No	Yes	No
	46.80	-7.5	23.0	0.10	0.50	5918	4882	0.4	8	2.7	1.00	8.21	2.7	FALSE	1.0	8.2	2.7	4.1	10	41		5809	4203	0.79	0.19	0.81	1.19	100.00	No	Yes	No
	46.90	-7.6	25.5	0.10	0.44	5930	4888	0.4	9	2.7	1.00	9.22	2.7	FALSE	1.0	9.2	2.7	3.7	11	40		5821	4209	0.79	0.19	0.81	1.19	100.00	No	Yes	No
	47.10	-7.8	26.6	0.10	0.42	5954	4899	0.4	10	2.6	1.00	9.64	2.6	FALSE	1.0	9.6	2.6	3.5	11	40		5845	4221	0.79	0.19	0.81	1.19	100.00	No	Yes	No
	47.20	-7.9	31.0	0.10	0.36	5966	4905	0.7	11	2.5	0.50	17.39	2.4	FALSE	0.5	17.4	2.4	2.2	20	44	0.087	5857	4226	0.79	0.19	0.81	1.19	0.45	Yes	Yes	Yes
	47.40	-8.1	34.1	0.20	0.64	5990	4917	0.7	13	2.6	0.50	19.29	2.4	FALSE	0.5	19.3	2.4	2.4	22	53	0.094	5881	4238	0.79	0.19	0.81	1.19	0.49	Yes	Yes	Yes
	47.60	-8.3	42.5	0.10	0.25	6014	4928	0.7	16	2.3	0.50	24.46	2.2	FALSE	0.5	24.5	2.2	1.6	28	45	0.087	5905	4249	0.79	0.19	0.81	1.19	0.45	Yes	Yes	Yes
	47.70	-8.4	58.4	0.20	0.36	6026	4934	0.7	22	2.3	0.50	34.28	2.1	FALSE	0.5	34.3	2.1	1.4	38	55	0.095	5917	4255	0.79	0.19	0.81	1.19	0.49	Yes	Yes	Yes
	47.90	-8.6	72.0	0.20	0.29	6050	4946	0.7	28	2.1	0.50	42.64	2.0	FALSE	0.5	42.6	2.0	1.3	47	59	0.099	5941	4267	0.78	0.19	0.81	1.19	0.51	Yes	Yes	Yes
	48.10	-8.8	74.4	0.30	0.42	6074	4957	0.7	29	2.2	0.50	44.07	2.0	FALSE	0.5	44.1	2.0	1.3	49	64	0.104	5965	4278	0.78	0.19	0.81	1.19	0.54	Yes	Yes	Yes
	48.20	-8.9	73.4	0.30	0.43	6086	4963	0.7	28	2.2	0.50	43.42	2.0	FALSE	0.5	43.4	2.0	1.3	48	64	0.104	5977	4284	0.78	0.19	0.81	1.19	0.54	Yes	Yes	Yes
	48.40	-9.1	67.5	0.30	0.47	6110	4974	0.7	26	2.2	0.50	39.73	2.1	FALSE	0.5	39.7	2.1	1.4	44	62	0.102	6001	4295	0.78	0.19	0.81	1.19	0.53	Yes	Yes	Yes
	48.60	-9.3	63.4	0.30	0.50	6134	4986	0.7	24	2.3	0.50	37.15	2.1	FALSE	0.5	37.6	2.1	1.5	41	61	0.101	6025	4307	0.78	0.19	0.81	1.19	0.52	Yes	Yes	Yes

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
	48.70	-9.4	64.2	0.30	0.49	6146	4992	0.7	24	2.3	0.50	37.62	2.1	FALSE	0.5	37.6	2.1	1.5	42	61	0.101	6037	4313	0.78	0.19	0.81	1.19	0.52	Yes	Yes	Yes
	48.90	-9.6	65.2	0.30	0.48	6170	5003	0.7	25	2.3	0.50	38.18	2.1	FALSE	0.5	38.2	2.1	1.4	42	61	0.101	6061	4324	0.78	0.19	0.81	1.19	0.53	Yes	Yes	Yes
	49.00	-9.7	62.2	0.30	0.51	6182	5009	0.6	24	2.3	0.50	36.31	2.1	FALSE	0.5	36.3	2.1	1.5	40	61	0.101	6073	4330	0.78	0.19	0.81	1.19	0.52	Yes	Yes	Yes
	49.20	-9.9	60.6	0.20	0.35	6206	5020	0.6	23	2.2	0.50	35.28	2.1	FALSE	0.5	35.3	2.1	1.4	39	55	0.096	6097	4341	0.77	0.19	0.81	1.19	0.50	Yes	Yes	Yes
	49.40	-10.1	62.3	0.30	0.51	6230	5032	0.6	24	2.3	0.50	36.28	2.1	FALSE	0.5	36.3	2.1	1.5	40	60	0.101	6121	4353	0.77	0.18	0.81	1.19	0.52	Yes	Yes	Yes
	49.50	-10.2	68.1	0.20	0.31	6242	5038	0.6	26	2.2	0.50	39.80	2.0	FALSE	0.5	39.8	2.0	1.3	44	57	0.098	6133	4359	0.77	0.18	0.81	1.19	0.51	Yes	Yes	Yes
	49.70	-10.4	86.6	0.30	0.36	6266	5049	0.6	33	2.1	0.50	51.07	1.9	FALSE	0.5	51.1	1.9	1.2	56	68	0.109	6157	4370	0.77	0.18	0.80	1.19	0.57	Yes	Yes	Yes
	49.90	-10.6	102.1	0.30	0.30	6290	5061	0.6	39	2.0	0.50	60.48	1.8	FALSE	0.5	60.5	1.8	1.1	66	74	0.118	6181	4382	0.77	0.18	0.80	1.19	0.62	Yes	Yes	Yes
	50.00	-10.7	105.7	0.40	0.39	6302	5066	0.6	40	2.0	0.50	62.64	1.9	FALSE	0.5	62.6	1.9	1.2	68	79	0.125	6193	4388	0.77	0.18	0.80	1.19	0.65	Yes	Yes	Yes
	50.20	-10.9	96.7	0.40	0.43	6326	5078	0.6	37	2.1	0.50	57.07	1.9	FALSE	0.5	57.1	1.9	1.2	62	75	0.119	6217	4399	0.77	0.18	0.80	1.19	0.62	Yes	Yes	Yes
	50.40	-11.1	85.3	0.30	0.37	6350	5090	0.6	32	2.1	0.50	50.05	1.9	FALSE	0.5	50.1	1.9	1.2	55	67	0.108	6241	4411	0.76	0.18	0.80	1.19	0.56	Yes	Yes	Yes
	50.50	-11.2	79.1	0.30	0.40	6362	5095	0.6	30	2.2	0.50	46.24	2.0	FALSE	0.5	46.2	2.0	1.3	51	65	0.106	6253	4416	0.76	0.18	0.80	1.19	0.55	Yes	Yes	Yes
	50.70	-11.4	76.3	0.50	0.68	6386	5107	0.6	29	2.3	0.50	44.48	2.1	FALSE	0.5	44.5	2.1	1.5	49	72	0.115	6277	4428	0.76	0.18	0.80	1.19	0.60	Yes	Yes	Yes
	50.90	-11.6	64.4	1.10	1.80	6410	5118	0.6	24	2.6	0.50	37.19	2.4	FALSE	0.5	37.2	2.4	2.3	41	97	0.164	6301	4439	0.76	0.18	0.80	1.19	0.85	Yes	Yes	Yes
	51.00	-11.7	66.3	1.10	1.74	6422	5124	0.6	25	2.5	0.50	38.32	2.4	FALSE	0.5	38.3	2.4	2.3	43	96	0.163	6313	4445	0.76	0.18	0.80	1.19	0.85	Yes	Yes	Yes
	51.20	-11.9	69.4	1.00	1.51	6446	5136	0.6	26	2.5	0.50	40.15	2.3	FALSE	0.5	40.1	2.3	2.1	45	92	0.152	6337	4457	0.76	0.18	0.80	1.19	0.79	Yes	Yes	Yes
	51.30	-12.0	80.4	0.70	0.91	6458	5141	0.6	30	2.3	0.50	46.79	2.2	FALSE	0.5	46.8	2.2	1.6	52	80	0.128	6349	4462	0.76	0.18	0.80	1.19	0.67	Yes	Yes	Yes
	51.50	-12.2	119.9	0.50	0.43	6482	5153	0.6	45	2.0	0.50	70.66	1.8	FALSE	0.5	70.7	1.8	1.1	77	87	0.141	6373	4474	0.75	0.18	0.80	1.19	0.73	Yes	Yes	Yes
	51.70	-12.4	128.9	0.40	0.32	6506	5164	0.6	49	1.9	0.50	76.02	1.7	FALSE	0.5	76.0	1.7	1.1	83	88	0.144	6397	4485	0.75	0.18	0.80	1.19	0.75	Yes	Yes	Yes
	51.80	-12.5	125.7	0.50	0.41	6518	5170	0.6	47	2.0	0.50	74.04	1.8	FALSE	0.5	74.0	1.8	1.1	80	89	0.146	6409	4491	0.75	0.18	0.80	1.19	0.76	Yes	Yes	Yes
	52.00	-12.7	112.7	0.40	0.37	6542	5182	0.6	42	2.0	0.50	66.10	1.8	FALSE	0.5	66.1	1.8	1.1	72	81	0.130	6433	4503	0.75	0.18	0.80	1.19	0.68	Yes	Yes	Yes
	52.20	-12.9	99.5	0.30	0.31	6566	5193	0.6	37	2.0	0.50	58.05	1.8	FALSE	0.5	58.1	1.8	1.1	64	73	0.116	6457	4514	0.75	0.18	0.80	1.19	0.60	Yes	Yes	Yes
	52.30	-13.0	82.7	0.30	0.38	6578	5199	0.6	31	2.1	0.50	47.88	2.0	FALSE	0.5	47.9	2.0	1.3	53	66	0.107	6469	4520	0.75	0.18	0.80	1.19	0.56	Yes	Yes	Yes
	52.50	-13.2	80.7	0.30	0.39	6602	5210	0.6	30	2.2	0.50	46.62	2.0	FALSE	0.5	46.6	2.0	1.3	51	65	0.106	6493	4532	0.75	0.18	0.80	1.19	0.55	Yes	Yes	Yes
	52.70	-13.4	83.5	0.30	0.37	6626	5222	0.6	31	2.1	0.50	48.25	2.0	FALSE	0.5	48.2	2.0	1.2	53	66	0.107	6517	4543	0.75	0.18	0.80	1.19	0.56	Yes	Yes	Yes
	52.80	-13.5	95.0	0.30	0.33	6638	5228	0.6	35	2.1	0.50	55.13	1.9	FALSE	0.5	55.1	1.9	1.2	60	71	0.113	6529	4549	0.74	0.18	0.80	1.19	0.59	Yes	Yes	Yes
	53.00	-13.7	93.3	0.30	0.33	6662	5239	0.6	34	2.1	0.50	54.04	1.9	FALSE	0.5	54.0	1.9	1.2	59	70	0.112	6553	4560	0.74	0.18	0.80	1.19	0.58	Yes	Yes	Yes
	53.20	-13.9	84.3	0.30	0.37	6686	5251	0.6	31	2.1	0.50	48.58	2.0	FALSE	0.5	48.6	2.0	1.2	54	66	0.107	6577	4572	0.74	0.18	0.80	1.19	0.56	Yes	Yes	Yes
	53.30	-14.0	88.0	0.30	0.35	6698	5257	0.6	32	2.1	0.50	50.76	1.9	FALSE	0.5	50.8	1.9	1.2	56	68	0.109	6589	4578	0.74	0.18	0.80	1.19	0.57	Yes	Yes	Yes
	53.50	-14.2	93.5	0.30	0.33	6722	5268	0.6	34	2.1	0.50	54.00	1.9	FALSE	0.5	54.0	1.9	1.2	59	70	0.112	6613	4589	0.74	0.18	0.80	1.19	0.59	Yes	Yes	Yes
	53.60	-14.3	99.8	0.40	0.41	6734	5274	0.6	37	2.1	0.50	57.73	1.9	FALSE	0.5	57.7	1.9	1.2	63	75	0.120	6625	4595	0.74	0.18	0.80	1.19	0.63	Yes	Yes	Yes
	53.80	-14.5	102.4	0.40	0.40	6758	5285	0.6	37	2.1	0.50	59.22	1.9	FALSE	0.5	59.2	1.9	1.2	65	76	0.121	6649	4606	0.74	0.18	0.80	1.19	0.64	Yes	Yes	Yes
	54.00	-14.7	107.5	0.40	0.38	6782	5297	0.6	39	2.0	0.50	62.19	1.9	FALSE	0.5	62.2	1.9	1.2	68	78	0.125	6673	4618	0.73	0.18	0.80	1.19	0.65	Yes	Yes	Yes
	54.10	-14.8	111.0	0.40	0.37	6794	5303	0.6	41	2.0	0.50	64.25	1.8	FALSE	0.5	64.2	1.8	1.1	70	80	0.127	6685	4624	0.73	0.18	0.79	1.19	0.67	Yes	Yes	Yes
	54.30	-15.0	106.5	0.30	0.29	6818	5314	0.6	39	2.0	0.50	61.49	1.8	FALSE	0.5	61.5	1.8	1.1	67	75	0.119	6709	4635	0.73	0.18	0.79	1.19	0.63	Yes	Yes	Yes
	54.50	-15.2	111.3	0.30	0.28	6842	5326	0.6	41	2.0	0.50	64.27	1.8	FALSE	0.5	64.3	1.8	1.1	70	77	0.123	6733	4647	0.73	0.18	0.79	1.19	0.64	Yes	Yes	Yes
	54.60	-15.3	113.4	0.20	0.18	6854	5331	0.6	41	1.9	0.50	65.48	1.7	FALSE	0.5	65.5	1.7	1.1	71	75	0.120	6745	4653	0.73	0.18	0.79	1.19	0.63	Yes	Yes	Yes
	54.80	-15.5	98.7	0.20	0.21	6878	5343	0.6	36	2.0	0.50	56.66	1.8	FALSE	0.5	56.7	1.8	1.1	62	69	0.110	6769	4664	0.73	0.18	0.79	1.19	0.58	Yes	Yes	Yes
	55.00	-15.7	76.3	0.20	0.27	6902	5354	0.6	27	2.1	0.50	43.28	1.9	FALSE	0.5	43.3	1.9	1.2	48	59	0.099	6793	4676	0.73	0.18	0.79	1.19	0.52	Yes	Yes	Yes
	55.10	-15.8	70.5	0.30	0.45	6914	5360	0.6	25	2.2	0.50	39.81	2.1	FALSE	0.5	39.8	2.1	1.4	44	62	0.102	6805	4681	0.73	0.18	0.79	1.19	0.54	Yes	Yes	Yes
	55.30	-16.0	68.8	0.30	0.46	6938	5372	0.6	24	2.3	0.50	38.76	2.1	FALSE	0.5	38.8	2.1	1.4	43	61	0.101	6829	4693	0.72	0.18	0.79	1.19	0.53	Yes	Yes	Yes
	55.40	-16.1	75.5	0.30	0.42	6950	5378	0.6	27	2.2	0.50	42.70	2.0	FALSE	0.5	42.7	2.0	1.3	47	63	0.103	6841	4699	0.72	0.18	0.79	1.19	0.54	Yes	Yes	Yes
	55.60	-16.3	90.6	0.30	0.34	6974	5389	0.6	32	2.1	0.50	51.59	1.9	FALSE	0.5	51.6	1.9	1.2	57	68	0.110	6865	4710	0.72	0.18	0.79	1.19	0.58	Yes	Yes	Yes
	55.80	-16.5	102.5	0.40	0.40	6998	5401	0.6	37	2.1	0.50	58.57	1.9	FALSE	0.5	58.6	1.9	1.2	64	76	0.121	6889	4722	0.72	0.18	0.79	1.19	0.64	Yes	Yes	Yes
	55.90	-16.6	102.3	0.40	0.40	7010	5406	0.6	37	2.1	0.50	58.42	1.9	FALSE	0.5	58.4	1.9	1.2	64	76	0.120	6901	4727	0.72	0.18	0.79	1.19	0.64	Yes	Yes	Yes
	56.10	-16.8	110.8	0.40	0.37	7034	5418	0.6	40	2.0	0.50	63.37	1.8	FALSE	0.5	63.4	1.8	1.1	69	79	0.126	6925	4739	0.72	0.18	0.79	1.19	0.67	Yes	Yes	Yes
	56.30	-17.0	117.5	0.40	0.35	7058	5429	0.6	42	2.0	0.50	67.25	1.8	FALSE	0.5	67.2	1.8	1.1	73	82	0.131	6949	4750	0.72	0.18	0.79	1.19	0.69	Yes	Yes	Yes
	56.40	-17.1	108.3	0.30	0.29	7070	5435	0.6	39	2.0	0.50	61.79	1.8	FALSE	0.5	61.8	1.8	1.1	68	75	0.120	6961	4756	0.72	0.18	0.79	1.19	0.63	Yes	Yes	Yes
	56.60	-17.3	92.0	0.30	0.34	7094	5447	0.6	32	2.1	0.50	52.11	1.9	FALSE	0.5	52.1	1.9	1.2	57	69	0.110	6985	4768	0.71	0.18	0.79	1.19	0.58	Yes	Yes	Yes
	56.80	-17.5	77.9	0.30	0.40	7118	5458	0.6	27	2.2	0.50	43.75	2.0	FALSE	0.5	43.7	2.0	1.3	49	63	0.104	7009	4779	0.71	0.18	0.79	1.19	0.55	Yes	Yes	Yes
	56.90	-17.6	77.9	0.30	0.40	7130	5464	0.6	27	2.2	0.50	43.72	2.0	FALSE	0.5	43.7	2.0	1.3	48	63	0.104	7021	4785	0.71	0.18	0.79	1.19	0.55	Yes	Yes	Yes
	57.10	-17.8	85.6	0.30	0.37	7154	5475	0.6	30	2.1	0.50	48.19	2.0	FALSE	0.5	48.2	2.0	1.2	53	66	0.107	7045	4797	0.71	0.18	0.79	1.19	0.57	Yes	Yes	Yes
	57.30	-18.0	89.7	0.30	0.35	7178	5487	0.6	31	2.1	0.50	50.54	1.9	FALSE	0.5	50.5	1.9	1.2	56	68	0.109	7069	4808	0.71	0.18	0.79	1.19	0.58	Yes	Yes	Yes
	57.40	-18.1	79.9	0.30	0.39	7190	5493	0.6	28	2.2	0.50	44.76	2.0	FALSE	0.5	44.8	2.0	1.3	50	64	0.104	7081	4814	0.71	0.18	0.79	1.19	0.55	Yes	Yes	Yes
	57.60	-18.3	73.2	0.30	0.43	7214	5504	0.6	25	2.2	0.50	40.78	2.0	FALSE	0.5	40.8	2.0	1.4	45	62	0.102	7105	4825	0.71	0.18	0.79	1.19	0.54	Yes	Yes	Yes
	57.70	-18.4	73.2	0.30	0.43	7226	5510	0.6	25	2.2	0.50	40.76	2.0	FALSE	0.5	40.8	2.0	1.4	45	62	0.102	7117	4831	0.70	0.18	0.79	1.19	0.54	Yes	Yes	Yes
	57.90	-18.6	73.7	0.20	0.29	7250	5522	0.6	25	2.2	0.50	41.00	2.0	FALSE	0.5	41.0	2.0	1.3	46	58	0.098	7141	4843	0.70	0.18	0.79	1.19	0.52	Yes	Yes	Yes
	58.10	-18.8	72.5	0.20	0.29	7274	5533	0.6	25	2.2	0.50	40.25	2.0	FALSE	0.5	40.3	2.0	1.3	45	58	0.098	7165	4854	0.70	0.18	0.79	1.19	0.52	Yes	Yes	Yes
	58.20	-18.9	73.5	0.20	0.29	7286	5539	0.6	25	2.2	0.50	40.81	2.0	FALSE	0.5	40.8	2.0	1.3	45	58	0.098	7177	4860	0.70	0.18	0.79	1.19	0.52	Yes	Yes	Yes
	58.40	-19.1	64.9	0.20	0.33	7310	5550	0.6	22	2.2	0.50	35.74	2.1	FALSE	0.5	35.7	2.1	1.4	40	55	0.096	7201	4871	0.70	0.18	0.79	1.19	0.51	Yes	Yes	Yes
	58.60	-19.3	58.6	0.20	0.36	7334	5562	0.6	20	2.3	0.50	32.03	2.1	FALSE	0.5	32.0	2.1	1.5	36	54	0.094	7225	4883	0.70	0.18	0.79	1.19	0.50	Yes	Yes	Yes
	58.70	-19.4	54.9	0.20	0.39	7346	5568	0.6	18	2.3	0.50	29.85	2.2	FALSE	0.5	29.8	2.2	1.6	34	53	0.094	7237	4889	0.70	0.18	0.79	1.19	0.50	Yes	Yes	Yes
	58.90	-19.6	52.3	0.20	0.41	7370	5579	0.6	17	2.4	0.50	28.30	2.2	FALSE	0.5	28.3	2.2	1.6	32	52	0.093	7261	4900	0.69	0.18	0.78	1.19	0.50	Yes	Yes	Yes
	59.10	-19.8	51.8	0.10	0.21	7394	5591	0.6	17	2.3	0.50	27.97	2.1	FALSE	0.5	28.0	2.1	1.4	32	46	0.088	7285	4912	0.69	0.18	0.78	1.19	0.47	Yes	Yes	Yes
	59.20	-19.9	48.9	0.20	0.44	7406	5596	0.6	16	2.4	0.50	26.27	2.2	FALSE	0.5	26.3	2.2	1.7	30	52	0.093	7297	4917	0.69	0.17	0.78	1.19	0.50	Yes	Yes	Yes
	59.40	-20.1	49.6	0.20	0.44	7430	5608	0.6	16	2.4	0.50	26.64	2.2	FALSE	0.5	26.6	2.2	1.7	30	52	0.093	7321	4929	0.69	0.17	0.78	1.19	0.50	Yes	Yes	Yes
	59.50	-20.2	55.4	0.20	0.39	7442	5614	0.6	18	2.3	0.50	29.99	2.2	FALSE	0.5	30.0	2.2	1.6	34	53	0.094	7333	4935	0.69	0.17	0.78	1.19	0.50	Yes	Yes	Yes
	59.70	-20.4	63.7	0.20	0.33	7466	5625	0.6	21	2.3	0.50	34.76	2.1	FALSE	0.5	34.8	2.1	1.4	39	55	0.095	7357	4946	0.69	0.17	0.78	1.19	0.51	Yes	Yes	Yes
	59.90	-20.6	63.6	0.20	0.33	7490	5637	0.6	21	2.3	0.50	34.66	2.1	FALSE	0.5	34.7	2.1	1.4	39	55	0.095	7381	4958	0.69	0.17	0.78	1.19	0.51	Yes	Yes	Yes
	60.00	-20.7	59.3	0.20	0.36	7502	5642	0.6	20	2.3	0.50	32.15	2.1	FALSE	0.5	32.2	2.1	1.5	36	54	0.094	7393	4964	0.69	0.17	0.78	1.19	0.51	Yes	Yes	Yes
	60.20	-20.9	56.7	0.30	0.57	7526	5654	0.6	19	2.4	0.50	30.61	2.2	FALSE	0.5	30.6	2.2	1.7	35	59	0.099	7417	4975	0.68	0.17	0.78	1.19	0.53	Yes	Yes	Yes
	60.40	-21.1	59.3	0.20	0.36	7550	5666	0.6	20	2.3	0.50	32.07	2.1	FALSE	0.5	32.1	2.1	1.5	36	54	0.094	7441	4987	0.68	0.17	0.78	1.19	0.51	Yes	Yes	Yes
	60.50	-21.2	67.8	0.20	0.31	7562	5671	0.6	23	2.2	0.50	36.96	2.0	FALSE	0.5	37.0	2.0	1.3	41	56	0.096	7453	4992	0.68	0.17	0.78	1.19	0.52	Yes	Yes	Yes
	60.70	-21.4	69.3	0.30	0.46	7586	5683	0.6	23	2.3	0.50	37.78	2.1	FALSE	0.5	37.8	2.1	1.4	42	61	0.101	7477	5004	0.68	0.17	0.78	1.19	0.54	Yes	Yes	Yes
	60.90	-21.6	75.2	0.30	0.42	7610	5694	0.6	25	2.2	0.50	41.14	2.0	FALSE	0.5	41.1	2.0	1.4	46	62	0.102	7501	5015	0.68	0.17	0.78	1.19	0.55	Yes	Yes	Yes
	61.00	-21.7	84.4	0.30	0.37	7622	5700	0.6	28	2.2	0.50	46.41	2.0	FALSE	0.5	46.4	2.0	1.3	51	65	0.105	7513	5021	0.68	0.17	0.78	1.19	0.57	Yes	Yes	Yes
	61.20	-21.9	91.7	0.30	0.34	7646	5712	0.6	31	2.1	0.50	50.56	1.9	FALSE	0.5	50.6	1.9	1.2	56	67	0.109	7537	5033	0.68	0.17	0.78	1.19	0.59	Yes	Yes	Yes
	61.40	-22.1	92.1	0.30	0.34	7670	5723	0.6	31	2.1	0.50	50.73	1.9	FALSE	0.5	50.7	1.9	1.2	56	68	0.109	7561	5044	0.67	0.17	0.78	1.19	0.59	Yes	Yes	Yes
	61.50	-22.2	90.6	0.30	0.35	7682	5729	0.6	30	2.1	0.50	49.84	1.9	FALSE	0.5	49.8	1.9	1.2	55	67	0.108	7573	5050	0.67	0.17	0.78	1.19	0.58	Yes	Yes	Yes
	61.70	-22.4	91.6	0.30	0.34	7706	5740	0.6	31	2.1	0.50	50.35	1.9	FALSE	0.5	50.4	1.9	1.2	56	67	0.108	7597	5061	0.67	0.17	0.78	1.19	0.59	Yes	Yes	Yes
	61.80	-22.5	88.7	0.30	0.35	7718	5746	0.6	30	2.1	0.50	48.66	1.9	FALSE	0.5	48.7	1.9	1.2	54	66	0.107	7609	5067	0.67	0.17	0.78	1.19	0.58	Yes	Yes	Yes
	62.00	-22.7	93.2	0.30	0.34	7742	5758	0.6	31	2.1	0.50	51.18	1.9	FALSE	0.5	51.2	1.9	1.2	57	68	0.109	7633	5079	0.67	0.17	0.78	1.19	0.59	Yes	Yes	Yes
	62.20	-22.9	93.5	0.30	0.33	7766	5769	0.6	31	2.1	0.50	51.30	1.9	FALSE	0.5	51.3	1.9	1.2	57	68	0.109	7657	5090	0.67	0.17	0.78	1.19	0.59	Yes	Yes	Yes
	62.30	-23.0	84.2	0.30	0.37	7778	5775	0.6	28	2.2	0.50	45.95	2.0	FALSE	0.5	45.9	2.0	1.3	51	65	0.105	7669	5096	0.67	0.17	0.78	1.19	0.57	Yes	Yes	Yes
	62.50	-23.2	82.2	0.30	0.38	7802	5786	0.6	27	2.2	0.50	44.75	2.0	FALSE	0.5	44.8	2.0	1.3	50	64	0.104	7693	5108	0.67	0.17	0.78	1.19	0.57	Yes	Yes	Yes
	62.70	-23.4	80.8	0.30	0.39	7826	5798	0.6	27	2.2	0.50	43.90	2.0	FALSE	0.5	43.9	2.0	1.3	49	63	0.104	7717	5119	0.66	0.17	0.78	1.19	0.56	Yes	Yes	Yes
	62.80	-23.5	89.0	0.30	0.35	7838	5804	0.6	29	2.1	0.50	48.56	1.9	FALSE	0.5	48.6	1.9	1.2	54	66	0.107	7729	5125	0.66	0.17	0.78	1.19	0.58	Yes	Yes	Yes
	63.00	-23.7	89.1	0.30	0.35	7862	5815	0.6	29	2.1	0.50	48.56	1.9	FALSE	0.5	48.6	1.9	1.2	54	66	0.107	7753	5136	0.66	0.17	0.78	1.19	0.58	Yes	Yes	Yes
	63.20	-23.9	77.3	0.30	0.41	7886	5827	0.6	25	2.2	0.50	41.78	2.0	FALSE	0.5	41.8	2.0	1.3	47	62	0.102	7777	5148	0.66	0.17	0.78	1.19	0.56	Yes	Yes	Yes
	63.30	-24.0	72.4	0.30	0.44	7898	5833	0.6	23	2.3	0.50	38.97	2.1	FALSE	0.5	39.0	2.1	1.4	44	61	0.101	7789	5154	0.66	0.17	0.78	1.19	0.55	Yes	Yes	Yes
	63.50	-24.2	68.9	0.30	0.46	7922	5844	0.6	22	2.3	0.50	36.93	2.1	FALSE	0.5	36.9	2.1	1.5	41	60	0.100	7813	5165	0.66	0.17	0.78	1.19	0.55	Yes	Yes	Yes
	63.60	-24.3	69.3	0.30	0.46	7934	5850	0.6	22	2.3	0.50	37.14	2.1	FALSE	0.5	37.1	2.1	1.4	42	60	0.100	7825	5171	0.66	0.17	0.78	1.19	0.55	Yes	Yes	Yes

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude: Kσ	MSF	Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
	63.80	-24.5	70.1	0.30	0.45	7958	5861	0.6	23	2.3	0.50	37.55	2.1	FALSE	0.5	37.6	2.1	1.4	42	60	0.100	7849	5182	0.65	0.17	0.78	1.19	0.55	Yes	Yes	Yes
	64.00	-24.7	75.5	0.30	0.42	7982	5873	0.6	24	2.2	0.50	40.57	2.0	FALSE	0.5	40.6	2.0	1.4	45	62	0.102	7873	5194	0.65	0.17	0.77	1.19	0.56	Yes	Yes	Yes
	64.10	-24.8	84.3	0.30	0.37	7994	5879	0.6	27	2.2	0.50	45.54	2.0	FALSE	0.5	45.5	2.0	1.3	51	64	0.105	7885	5200	0.65	0.17	0.77	1.19	0.57	Yes	Yes	Yes
	64.30	-25.0	94.1	0.30	0.33	8018	5890	0.6	31	2.1	0.50	51.04	1.9	FALSE	0.5	51.0	1.9	1.2	56	68	0.109	7909	5211	0.65	0.17	0.77	1.19	0.60	Yes	Yes	Yes
	64.50	-25.2	99.2	0.30	0.32	8042	5902	0.6	32	2.1	0.50	53.87	1.9	FALSE	0.5	53.9	1.9	1.2	59	70	0.111	7933	5223	0.65	0.17	0.77	1.19	0.61	Yes	Yes	Yes
	64.60	-25.3	99.6	0.30	0.31	8054	5907	0.6	32	2.1	0.50	54.06	1.9	FALSE	0.5	54.1	1.9	1.2	60	70	0.112	7945	5229	0.65	0.17	0.77	1.19	0.61	Yes	Yes	Yes
	64.80	-25.5	95.8	0.30	0.33	8078	5919	0.6	31	2.1	0.50	51.86	1.9	FALSE	0.5	51.9	1.9	1.2	57	68	0.110	7969	5240	0.65	0.17	0.77	1.19	0.60	Yes	Yes	Yes
	65.00	-25.7	92.2	0.30	0.34	8102	5930	0.6	30	2.1	0.50	49.77	1.9	FALSE	0.5	49.8	1.9	1.2	55	67	0.108	7993	5252	0.65	0.17	0.77	1.19	0.59	Yes	Yes	Yes
	65.10	-25.8	88.9	0.30	0.35	8114	5936	0.6	29	2.2	0.50	47.88	1.9	FALSE	0.5	47.9	1.9	1.2	53	66	0.106	8005	5257	0.64	0.17	0.77	1.19	0.59	Yes	Yes	Yes
	65.30	-26.0	75.6	0.30	0.42	8138	5948	0.6	24	2.3	0.50	40.33	2.0	FALSE	0.5	40.3	2.0	1.4	45	62	0.102	8029	5269	0.64	0.17	0.77	1.19	0.56	Yes	Yes	Yes
	65.50	-26.2	67.6	0.30	0.47	8162	5959	0.6	21	2.3	0.50	35.77	2.1	FALSE	0.5	35.8	2.1	1.5	40	60	0.100	8053	5280	0.64	0.17	0.77	1.19	0.55	Yes	Yes	Yes
	65.60	-26.3	65.3	0.30	0.49	8174	5965	0.6	21	2.3	0.50	34.46	2.1	FALSE	0.5	34.5	2.1	1.5	39	59	0.099	8065	5286	0.64	0.17	0.77	1.19	0.55	Yes	Yes	Yes
	65.80	-26.5	69.7	0.30	0.46	8198	5977	0.6	22	2.3	0.50	36.89	2.1	FALSE	0.5	36.9	2.1	1.4	41	60	0.100	8089	5298	0.64	0.17	0.77	1.19	0.56	Yes	Yes	Yes
	65.90	-26.6	82.7	0.30	0.38	8210	5982	0.6	26	2.2	0.50	44.18	2.0	FALSE	0.5	44.2	2.0	1.3	49	64	0.104	8101	5303	0.64	0.17	0.77	1.19	0.58	Yes	Yes	Yes
	66.10	-26.8	85.1	0.30	0.37	8234	5994	0.6	27	2.2	0.50	45.48	2.0	FALSE	0.5	45.5	2.0	1.3	51	64	0.105	8125	5315	0.64	0.17	0.77	1.19	0.58	Yes	Yes	Yes
	66.30	-27.0	96.4	0.30	0.33	8258	6005	0.6	31	2.1	0.50	51.77	1.9	FALSE	0.5	51.8	1.9	1.2	57	68	0.109	8149	5326	0.63	0.17	0.77	1.19	0.61	Yes	Yes	Yes
	66.40	-27.1	89.8	0.30	0.35	8270	6011	0.6	29	2.2	0.50	48.04	1.9	FALSE	0.5	48.0	1.9	1.2	53	66	0.106	8161	5332	0.63	0.17	0.77	1.19	0.59	Yes	Yes	Yes
	66.60	-27.3	79.3	0.30	0.40	8294	6023	0.6	25	2.2	0.50	42.10	2.0	FALSE	0.5	42.1	2.0	1.3	47	62	0.103	8185	5344	0.63	0.16	0.77	1.19	0.57	Yes	Yes	Yes
	66.80	-27.5	74.9	0.30	0.42	8318	6034	0.6	23	2.3	0.50	39.59	2.1	FALSE	0.5	39.6	2.1	1.4	44	61	0.101	8209	5355	0.63	0.16	0.77	1.19	0.56	Yes	Yes	Yes
	66.90	-27.6	74.1	0.30	0.43	8330	6040	0.6	23	2.3	0.50	39.12	2.1	FALSE	0.5	39.1	2.1	1.4	44	61	0.101	8221	5361	0.63	0.16	0.77	1.19	0.56	Yes	Yes	Yes
	67.10	-27.8	77.4	0.30	0.41	8354	6051	0.6	24	2.2	0.50	40.93	2.0	FALSE	0.5	40.9	2.0	1.3	46	62	0.102	8245	5373	0.63	0.16	0.77	1.19	0.57	Yes	Yes	Yes
	67.30	-28.0	85.0	0.30	0.37	8378	6063	0.6	27	2.2	0.50	45.12	2.0	FALSE	0.5	45.1	2.0	1.3	50	64	0.104	8269	5384	0.63	0.16	0.77	1.19	0.58	Yes	Yes	Yes
	67.40	-28.1	89.9	0.30	0.35	8390	6069	0.6	28	2.2	0.50	47.83	1.9	FALSE	0.5	47.8	1.9	1.2	53	66	0.106	8281	5390	0.63	0.16	0.77	1.19	0.60	Yes	Yes	Yes
	67.60	-28.3	81.3	0.30	0.39	8414	6080	0.6	25	2.2	0.50	42.99	2.0	FALSE	0.5	43.0	2.0	1.3	48	63	0.103	8305	5401	0.62	0.16	0.77	1.19	0.58	Yes	Yes	Yes
	67.70	-28.4	75.5	0.30	0.42	8426	6086	0.6	23	2.3	0.50	39.73	2.1	FALSE	0.5	39.7	2.1	1.4	45	61	0.101	8317	5407	0.62	0.16	0.77	1.19	0.57	Yes	Yes	Yes
	67.90	-28.6	73.8	0.30	0.43	8450	6098	0.6	23	2.3	0.50	38.74	2.1	FALSE	0.5	38.7	2.1	1.4	43	61	0.101	8341	5419	0.62	0.16	0.77	1.19	0.57	Yes	Yes	Yes
	68.10	-28.8	75.1	0.30	0.42	8474	6109	0.6	23	2.3	0.50	39.42	2.1	FALSE	0.5	39.4	2.1	1.4	44	61	0.101	8365	5430	0.62	0.16	0.77	1.19	0.57	Yes	Yes	Yes
	68.20	-28.9	79.5	0.30	0.40	8486	6115	0.6	25	2.2	0.50	41.84	2.0	FALSE	0.5	41.8	2.0	1.3	47	62	0.102	8377	5436	0.62	0.16	0.77	1.19	0.58	Yes	Yes	Yes
	68.40	-29.1	91.0	0.30	0.35	8510	6126	0.6	28	2.2	0.50	48.19	1.9	FALSE	0.5	48.2	1.9	1.2	53	66	0.107	8401	5447	0.62	0.16	0.77	1.19	0.60	Yes	Yes	Yes
	68.60	-29.3	109.2	0.40	0.38	8534	6138	0.6	34	2.1	0.50	58.23	1.9	FALSE	0.5	58.2	1.9	1.2	64	75	0.120	8425	5459	0.62	0.16	0.77	1.19	0.68	Yes	Yes	Yes
	68.70	-29.4	117.8	0.40	0.35	8546	6144	0.6	37	2.1	0.50	62.97	1.8	FALSE	0.5	63.0	1.8	1.1	69	79	0.125	8437	5465	0.61	0.16	0.77	1.19	0.71	Yes	Yes	Yes
	68.90	-29.6	114.1	0.40	0.36	8570	6155	0.6	36	2.1	0.50	60.86	1.9	FALSE	0.5	60.9	1.9	1.2	67	77	0.123	8461	5476	0.61	0.16	0.77	1.19	0.69	Yes	Yes	Yes
	69.10	-29.8	107.9	0.40	0.39	8594	6167	0.6	34	2.1	0.50	57.36	1.9	FALSE	0.5	57.4	1.9	1.2	63	75	0.119	8485	5488	0.61	0.16	0.77	1.19	0.67	Yes	Yes	Yes
	69.20	-29.9	105.3	0.40	0.40	8606	6172	0.6	33	2.1	0.50	55.89	1.9	FALSE	0.5	55.9	1.9	1.2	62	74	0.117	8497	5493	0.61	0.16	0.77	1.19	0.66	Yes	Yes	Yes
	69.40	-30.1	108.4	0.30	0.29	8630	6184	0.6	34	2.1	0.50	57.55	1.8	FALSE	0.5	57.5	1.8	1.1	63	72	0.115	8521	5505	0.61	0.16	0.76	1.19	0.65	Yes	Yes	Yes
	69.60	-30.3	125.4	0.30	0.25	8654	6195	0.6	39	2.0	0.50	66.88	1.8	FALSE	0.5	66.9	1.8	1.1	73	79	0.126	8545	5517	0.61	0.16	0.76	1.19	0.71	Yes	Yes	Yes
	69.70	-30.4	143.8	0.30	0.22	8666	6201	0.6	45	1.9	0.50	77.00	1.7	FALSE	0.5	77.0	1.7	1.0	84	86	0.139	8557	5522	0.61	0.16	0.76	1.19	0.79	Yes	Yes	Yes
	69.90	-30.6	142.9	0.30	0.22	8690	6213	0.6	45	1.9	0.50	76.43	1.7	FALSE	0.5	76.4	1.7	1.0	83	85	0.138	8581	5534	0.61	0.16	0.76	1.19	0.79	Yes	Yes	Yes
	70.00	-30.7	133.4	0.30	0.23	8702	6218	0.6	42	1.9	0.50	71.15	1.7	FALSE	0.5	71.2	1.7	1.1	78	82	0.131	8593	5540	0.60	0.16	0.76	1.19	0.75	Yes	Yes	Yes
	70.20	-30.9	135.9	0.30	0.23	8726	6230	0.6	42	1.9	0.50	72.46	1.7	FALSE	0.5	72.5	1.7	1.0	79	83	0.133	8617	5551	0.60	0.16	0.76	1.19	0.76	Yes	Yes	Yes
	70.40	-31.1	139.8	0.30	0.22	8750	6242	0.6	43	1.9	0.50	74.53	1.7	FALSE	0.5	74.5	1.7	1.0	81	84	0.136	8641	5563	0.60	0.16	0.76	1.19	0.78	Yes	Yes	Yes
	70.50	-31.2	131.9	0.30	0.24	8762	6247	0.6	41	2.0	0.50	70.15	1.7	FALSE	0.5	70.1	1.7	1.1	77	81	0.130	8653	5568	0.60	0.16	0.76	1.19	0.74	Yes	Yes	Yes
	70.70	-31.4	109.6	0.30	0.29	8786	6259	0.6	34	2.1	0.50	57.82	1.8	FALSE	0.5	57.8	1.8	1.1	64	72	0.115	8677	5580	0.60	0.16	0.76	1.19	0.66	Yes	Yes	Yes
	70.90	-31.6	93.2	0.50	0.56	8810	6270	0.6	28	2.2	0.50	48.75	2.0	FALSE	0.5	48.8	2.0	1.3	54	73	0.116	8701	5591	0.60	0.16	0.76	1.19	0.66	Yes	Yes	Yes
	71.00	-31.7	86.5	0.30	0.37	8822	6276	0.6	26	2.2	0.50	45.05	2.0	FALSE	0.5	45.1	2.0	1.3	50	64	0.104	8713	5597	0.60	0.16	0.76	1.19	0.60	Yes	Yes	Yes
	71.20	-31.9	84.0	0.30	0.38	8846	6288	0.6	25	2.2	0.50	43.63	2.0	FALSE	0.5	43.6	2.0	1.3	49	63	0.103	8737	5609	0.59	0.16	0.76	1.19	0.60	Yes	Yes	Yes
	71.40	-32.1	91.0	0.20	0.23	8870	6299	0.6	27	2.1	0.50	47.42	1.9	FALSE	0.5	47.4	1.9	1.2	53	62	0.102	8761	5620	0.59	0.16	0.76	1.19	0.59	Yes	Yes	Yes
	71.50	-32.2	91.8	0.20	0.23	8882	6305	0.6	28	2.1	0.50	47.83	1.9	FALSE	0.5	47.8	1.9	1.2	53	62	0.103	8773	5626	0.59	0.16	0.76	1.19	0.59	Yes	Yes	Yes
	71.70	-32.4	97.2	0.20	0.22	8906	6316	0.6	29	2.1	0.50	50.74	1.8	FALSE	0.5	50.7	1.8	1.1	56	64	0.105	8797	5637	0.59	0.16	0.76	1.19	0.61	Yes	Yes	Yes
	71.90	-32.6	112.2	0.20	0.19	8930	6328	0.6	34	2.0	0.50	58.88	1.8	FALSE	0.5	58.9	1.8	1.1	65	70	0.112	8821	5649	0.59	0.16	0.76	1.19	0.65	Yes	Yes	Yes
	72.00	-32.7	126.1	0.30	0.25	8942	6334	0.6	38	2.0	0.50	66.45	1.8	FALSE	0.5	66.4	1.8	1.1	73	78	0.125	8833	5655	0.59	0.16	0.76	1.19	0.72	Yes	Yes	Yes
	72.20	-32.9	132.4	0.20	0.16	8966	6345	0.6	40	1.9	0.50	69.82	1.7	FALSE	0.5	69.8	1.7	1.0	76	78	0.124	8857	5666	0.59	0.16	0.76	1.19	0.72	Yes	Yes	Yes
	72.30	-33.0	123.4	0.20	0.17	8978	6351	0.6	37	1.9	0.50	64.87	1.7	FALSE	0.5	64.9	1.7	1.0	71	75	0.119	8869	5672	0.59	0.16	0.76	1.19	0.69	Yes	Yes	Yes
	72.50	-33.2	103.3	0.20	0.20	9002	6362	0.6	31	2.0	0.50	53.85	1.8	FALSE	0.5	53.9	1.8	1.1	60	67	0.108	8893	5684	0.58	0.16	0.76	1.19	0.63	Yes	Yes	Yes
	72.70	-33.4	94.4	0.30	0.33	9026	6374	0.6	28	2.2	0.50	48.95	1.9	FALSE	0.5	49.0	1.9	1.2	54	66	0.107	8917	5695	0.58	0.16	0.76	1.19	0.62	Yes	Yes	Yes
	72.80	-33.5	90.3	0.20	0.23	9038	6380	0.6	27	2.1	0.50	46.69	1.9	FALSE	0.5	46.7	1.9	1.2	52	62	0.102	8929	5701	0.58	0.16	0.76	1.19	0.59	Yes	Yes	Yes
	73.00	-33.7	86.3	0.30	0.37	9062	6391	0.6	26	2.2	0.50	44.47	2.0	FALSE	0.5	44.5	2.0	1.3	50	64	0.104	8953	5712	0.58	0.15	0.76	1.19	0.61	Yes	Yes	Yes
	73.20	-33.9	88.4	0.20	0.24	9086	6403	0.6	26	2.1	0.50	45.56	1.9	FALSE	0.5	45.6	1.9	1.2	51	61	0.101	8977	5724	0.58	0.15	0.76	1.19	0.59	Yes	Yes	Yes
	73.30	-34.0	89.8	0.20	0.23	9098	6409	0.6	27	2.1	0.50	46.30	1.9	FALSE	0.5	46.3	1.9	1.2	52	61	0.101	8989	5730	0.58	0.15	0.76	1.19	0.59	Yes	Yes	Yes
	73.50	-34.2	91.0	0.20	0.23	9122	6420	0.6	27	2.1	0.50	46.90	1.9	FALSE	0.5	46.9	1.9	1.2	52	62	0.102	9013	5741	0.58	0.15	0.76	1.19	0.60	Yes	Yes	Yes
	73.70	-34.4	96.0	0.10	0.11	9146	6432	0.6	28	2.0	0.50	49.57	1.8	FALSE	0.5	49.6	1.8	1.1	55	61	0.101	9037	5753	0.57	0.15	0.76	1.19	0.59	Yes	Yes	Yes
	73.80	-34.5	100.6	0.20	0.21	9158	6437	0.6	30	2.1	0.50	52.03	1.8	FALSE	0.5	52.0	1.8	1.1	58	65	0.106	9049	5758	0.57	0.15	0.76	1.19	0.62	Yes	Yes	Yes
	74.00	-34.7	112.1	0.20	0.19	9182	6449	0.6	33	2.0	0.50	58.21	1.8	FALSE	0.5	58.2	1.8	1.1	64	70	0.112	9073	5770	0.57	0.15	0.76	1.19	0.66	Yes	Yes	Yes
	74.10	-34.8	126.8	0.20	0.16	9194	6455	0.6	38	1.9	0.50	66.13	1.7	FALSE	0.5	66.1	1.7	1.0	73	76	0.120	9085	5776	0.57	0.15	0.76	1.19	0.71	Yes	Yes	Yes
	74.30	-35.0	145.2	0.20	0.14	9218	6466	0.6	43	1.9	0.50	76.02	1.6	FALSE	0.5	76.0	1.6	1.0	83	83	0.133	9109	5787	0.57	0.15	0.76	1.19	0.79	Yes	Yes	Yes
	74.50	-35.2	177.5	0.40	0.23	9242	6478	0.6	53	1.8	0.50	93.39	1.6	FALSE	0.5	93.4	1.6	1.0	101	101	0.177	9133	5799	0.57	0.15	0.76	1.19	1.05	Yes	Yes	Yes
	74.60	-35.3	204.8	0.60	0.30	9254	6483	0.6	62	1.8	0.50	108.09	1.6	FALSE	0.5	108.1	1.6	1.0	117	117	0.229	9145	5805	0.57	0.15	0.76	1.19	1.36	Yes	Yes	Yes
	74.80	-35.5	209.7	0.70	0.34	9278	6495	0.6	63	1.8	0.50	110.63	1.6	FALSE	0.5	110.6	1.6	1.0	120	120	0.239	9169	5816	0.57	0.15	0.76	1.19	1.42	Yes	Yes	No
	75.00	-35.7	210.2	0.60	0.29	9302	6506	0.6	63	1.8	0.50	110.79	1.6	FALSE	0.5	110.8	1.6	1.0	120	120	0.240	9193	5828	0.56	0.15	0.76	1.19	1.43	Yes	Yes	No
	75.10	-35.8	193.3	0.40	0.21	9314	6512	0.6	58	1.8	0.50	101.64	1.6	FALSE	0.5	101.6	1.6	1.0	110	110	0.204	9205	5833	0.56	0.15	0.75	1.19	1.22	Yes	Yes	Yes
	75.30	-36.0	182.6	0.40	0.22	9338	6524	0.6	55	1.8	0.50	95.78	1.6	FALSE	0.5	95.8	1.6	1.0	104	104	0.185	9229	5845	0.56	0.15	0.75	1.19	1.10	Yes	Yes	Yes
	75.50	-36.2	170.0	0.30	0.18	9362	6535	0.6	51	1.8	0.50	88.91	1.6	FALSE	0.5	88.9	1.6	1.0	97	97	0.164	9253	5856	0.56	0.15	0.75	1.19	0.98	Yes	Yes	Yes
	75.60	-36.3	158.9	0.30	0.19	9374	6541	0.6	47	1.9	0.50	82.90	1.6	FALSE	0.5	82.9	1.6	1.0	90	90	0.149	9265	5862	0.56	0.15	0.75	1.19	0.89	Yes	Yes	Yes
	75.80	-36.5	148.7	0.30	0.21	9398	6553	0.6	44	1.9	0.50	77.34	1.7	FALSE	0.5	77.3	1.7	1.0	85	86	0.139	9289	5874	0.56	0.15	0.75	1.19	0.83	Yes	Yes	Yes
	76.00	-36.7	138.5	0.30	0.22	9422	6564	0.6	41	1.9	0.50	71.80	1.7	FALSE	0.5	71.8	1.7	1.0	79	82	0.132	9313	5885	0.56	0.15	0.75	1.19	0.78	Yes	Yes	Yes
	76.10	-36.8	120.1	0.30	0.26	9434	6570	0.6	35	2.0	0.50	61.89	1.8	FALSE	0.5	61.9	1.8	1.1	68	75	0.119	9325	5891	0.56	0.15	0.75	1.19	0.71	Yes	Yes	Yes
	76.30	-37.0	107.1	0.20	0.20	9458	6581	0.6	31	2.0	0.50	54.86	1.8	FALSE	0.5	54.9	1.8	1.1	61	67	0.108	9349	5902	0.56	0.15	0.75	1.19	0.65	Yes	Yes	Yes
	76.40	-37.1	105.3	0.30	0.30	9470	6587	0.6	31	2.1	0.50	53.87	1.9	FALSE	0.5	53.9	1.9	1.2	60	69	0.111	9361	5908	0.56	0.15	0.75	1.19	0.66	Yes	Yes	Yes
	76.60	-37.3	104.3	0.30	0.30	9494	6599	0.6	30	2.1	0.50	53.28	1.9	FALSE	0.5	53.3	1.9	1.2	59	69	0.111	9385	5920	0.56	0.15	0.75	1.19	0.66	Yes	Yes	Yes
	76.80	-37.5	105.0	0.40	0.40	9518	6610	0.6	30	2.2	0.50	53.61	1.9	FALSE	0.5	53.6	1.9	1.2	59	72	0.115	9409	5931	0.56	0.15	0.75	1.19	0.68	Yes	Yes	Yes
	76.90	-37.6	111.3	0.40	0.38	9530	6616	0.6	32	2.1	0.50	56.95	1.9	FALSE	0.5	56.9	1.9	1.2	63	74	0.118	9421	5937	0.56	0.15	0.75	1.19	0.70	Yes	Yes	Yes
	77.10	-37.8	111.5	0.30	0.28	9554	6627	0.6	32	2.1	0.50	57.00	1.8	FALSE	0.5	57.0	1.8	1.1	63	72	0.114	9445	5949	0.56	0.15	0.75	1.19	0.68	Yes	Yes	Yes
	77.30	-38.0	105.6	0.30	0.30	9578	6639	0.6	30	2.1	0.50	53.79	1.9	FALSE	0.5	53.8	1.9	1.2	60	69	0.111	9469	5960	0.56	0.15	0.75	1.19	0.66	Yes	Yes	Yes
	77.40	-38.1	99.8	0.90	0.95	9590	6645	0.6	29	2.3	0.50	50.67	2.1	FALSE	0.5	50.7	2.1	1.5	56	85	0.138	9481	5966	0.56	0.15	0.75	1.19	0.82	Yes	Yes	Yes
	77.60	-38.3	118.5	1.80	1.58	9614	6656	0.6	34	2.4	0.50	60.59	2.2	FALSE	0.5	60.6	2.2	1.7	67	112	0.211	9505	5977	0.56	0.15	0.75	1.19	1.25	Yes	Yes	Yes
	77.80	-38.5	155.1	1.00	0.67	9638	6668	0.6	45	2.1	0.50	80.02	1.9	FALSE	0.5	80.0	1.9	1.2	87	102	0.180	9529	5989	0.56	0.15	0.75	1.19	1.06	Yes	Yes	Yes
	77.90	-38.6	200.3	1.20	0.61	9650	6674	0.6	59	2.0	0.50	104.04	1.8	FALSE	0.5	104.0	1.8	1.1	113	122	0.250	9541	5995	0.56	0.15	0.75	1.19	1.47	Yes	Yes	No
	78.10	-38.8	132.4	1.20	0.94	9674	6685	0.6	38	2.2	0.50	67.83	2.0	FALSE	0.5	67.8	2.0	1.3	74	100	0.172	9565	6006	0.56	0.15	0.75	1.19	1.01	Yes	Yes	Yes
	78.20	-38.9	196.8	1.30	0.68	9686	6691	0.6	57	2.0	0.50	102.03	1.8	FALSE	0.5	102.0	1.8	1.1	111	122	0.251	9577	6012	0.56	0.15	0.75	1.19	1.48	Yes	Yes	No
	78.40	-39.1	265.9	0.40	0.15	9710	6702	0.6	78	1.6	0.50	138.64	1.4	FALSE	0.5	138.6	1.4	1.0	149	149	0.390	9601	6023	0.56	0.15	0.75	1.19	2.30	Yes	Yes	No
	78.60	-39.3	299.1	0.60	0.20	9734	6714	0.6	88	1.6	0.50	156.13	1.4	FALSE	0.5	156.1	1.4	1.0	168	168	0.600	9625	6035	0.56	0.15	0.75	1.19	3.53	Yes	Yes	No
	78.70	-39.4	251.3	1.80	0.73	9746	6720	0.6	73	1.9	0.50	130.70	1.7	FALSE	0.5	130.7	1.7	1.1	141	150	0.391	9637	6041	0.56	0.15	0.75	1.19	2.30	Yes	Yes	No

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																											Kσ	MSF				
	78.90	-39.6	402.9	1.40	0.35	9770	6731	0.6	118	1.6	0.50	210.92	1.4	FALSE	0.5	210.9	1.4	1.0	226	226	0.600	9661	6052	0.56	0.15	0.75	1.19	3.52	Yes	Yes	No
	79.10	-39.8	456.7	1.40	0.31	9794	6743	0.6	134	1.5	0.50	239.22	1.3	FALSE	0.5	239.2	1.3	1.0	256	256	0.600	9685	6064	0.56	0.15	0.75	1.19	3.52	Yes	Yes	No
	79.20	-39.9	555.0	1.40	0.25	9806	6748	0.6	163	1.4	0.50	291.15	1.2	FALSE	0.5	291.1	1.2	1.0	311	311	0.600	9697	6069	0.56	0.15	0.75	1.19	3.52	Yes	Yes	No

Project: I Street Bridge Replacement
Client: Mark Thomas and Company
Subject: EQ Analysis - I Street Bridge

Factors of Safety against Liquefaction
WM0004_0030C - I Street Bridge, Sacramento

Purpose: Evaluate susceptibility of sand-like soils to liquefaction.

Method: Use the "simplified procedure" practice for evaluating liquefaction of resistance of soils based on CPT results. The equations are based on the technical update presented in Reference 1 and are listed at the end of the spreadsheet.

References:
1) Youd, T. L. et al. (2001). "Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils". J. Geotech. and Geoenv. Engrg., ASCE, 127(4):297-313.

Assumptions:

Unit Wt. of Sand, Silt & Gravel above GWT, γ [pcf]	130.0	Assumed value based on coarser-grained units close to the ground surface
Unit Wt. of Sand, Silt & Gravel below GWT, γ [pcf]	120.0	Assumed value based on finer-grained units further from the ground surface
Earthquake magnitude	7	Magnitude is assumed based off previous WSAFCA Study
Depth to Groundwater at Time of Drilling (ft)	14.6	
Depth to Groundwater for Design (ft)	8.4	
Ground Surface Elevation	28.40	Ground Surface Elevation Listed on CPT log
Earthquake PGA (g)	0.262	

Youd et al 2001 Eqn. No.	Equation
12, 13	$q_{c1N} = C_Q(q_c/p_{atm})$ where $C_Q = (p_{atm}/\sigma'_{vo})^n$
18, 19	$q_{c1Ncs} = K_c q_{c1N}$ where $K_c = -0.403I_c^4 + 5.581I_c^3 - 21.63I_c^2 + 33.75I_c - 17.88$ for $I_c > 1.64$; $K_c = 1.0$ for $I_c <= 1.64$
11a,b	$CRR_{7.5} =$ $0.833(q_{c1Ncs}/1000) + 0.05$ for $q_{c1Ncs} < 50$; $93(q_{c1Ncs}/1000)^3 + 0.08$ for $50 \le q_{c1Ncs} < 160$; 0.60 for $q_{c1Ncs} \ge 160$
1	$CSR = \tau_{av} / \sigma'_{vo,b} = 0.65\,(a_{max}/g)(\sigma_{o,t,b}/\sigma'_{vo,b})r_d$
24	$MSF = 10^{2.24} / Mw^{2.56}$
31	$K_\sigma = [(\sigma'_v)_b / P_a]^{(f-1)}$ where f = 0.75 for an assumed relative density of 50%
30	$FS = (CRR_{7.5} / CSR) * MSF * K_\sigma$

Notes:
1) Highlighted = cell which is input by the user (cells not highlighted are computed by Excel).
2) Qt1 is the normalized cone tip resistance for an exponent n equal to 1.0. This is also equal to the conventional normalized tip resistance, Q, as has been previously used (e.g. Robertson 1990).
3) Ic (n=1) indicates that the soil behavior type index Ic is calculated by assuming n is equal to 1.0. Ic is defined in equation 14 of Youd et al. 2001.
4) $(\sigma'_{vo})_a$ is the vertical effective stress computed using the depth to water at the time of drilling.
5) $(\sigma'_v)_b$ is the vertical effective sress computed using the depth to water during the earthquake.
6) If Ic (n=1) is less than 2.6 and the updated Ic (column Q) is greater than 2.6, set n to 0.7 and recalculate Qtn and Ic
7)
8) Ic < 2.6 is the nominal range of liquefiable soils, per the Robertson and Wride (1998) method.
9) Data points with Ic > 2.6 are included in the triggering evaluations if the exponent n is manually set to 0.7 to be consistent with SPT or laboratory classification of soils.

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
							Note 4		Note 2	Note 3				Note 6									Note 5						Note 8		Note 9
	0.20	28.2	11.1	0.05	0.45	26	26	1.7	853	1.0	0.50	94.54	1.7	FALSE	0.5	94.5	1.7	1.1	19	20	0.067	26	26	1.00	0.17	1.00	1.19	0.47	Yes	No	No
	0.30	28.1	9.4	0.10	1.07	39	39	1.7	481	1.5	0.50	65.31	2.1	FALSE	0.5	65.3	2.1	1.4	16	22	0.069	39	39	1.00	0.17	1.00	1.19	0.48	Yes	No	No
	0.50	27.9	11.7	0.10	0.86	65	65	1.7	359	1.5	0.50	62.92	2.0	FALSE	0.5	62.9	2.0	1.3	20	27	0.072	65	65	1.00	0.17	1.00	1.19	0.51	Yes	No	No
	0.70	27.7	17.4	0.10	0.58	91	91	1.7	381	1.3	0.50	79.10	1.9	FALSE	0.5	79.1	1.9	1.1	30	34	0.078	91	91	1.00	0.17	1.00	1.19	0.55	Yes	No	No
	0.80	27.6	25.2	0.10	0.40	104	104	1.7	484	1.1	0.50	107.22	1.7	FALSE	0.5	107.2	1.7	1.0	43	43	0.086	104	104	1.00	0.17	1.00	1.19	0.60	Yes	No	No
	1.00	27.4	32.0	0.10	0.31	130	130	1.7	491	1.1	0.50	121.78	1.6	FALSE	0.5	121.8	1.6	1.0	54	54	0.095	130	130	1.00	0.17	1.00	1.19	0.67	Yes	No	No
	1.10	27.3	36.0	0.10	0.28	143	143	1.7	502	1.0	0.50	130.63	1.5	FALSE	0.5	130.6	1.5	1.0	61	61	0.101	143	143	1.00	0.17	1.00	1.19	0.71	Yes	No	No
	1.30	27.1	38.8	0.10	0.26	169	169	1.7	458	1.0	0.50	129.48	1.5	FALSE	0.5	129.5	1.5	1.0	66	66	0.107	169	169	1.00	0.17	1.00	1.19	0.75	Yes	No	No
	1.50	26.9	38.2	0.10	0.26	195	195	1.7	391	1.1	0.50	118.63	1.5	FALSE	0.5	118.6	1.5	1.0	65	65	0.105	195	195	1.00	0.17	1.00	1.19	0.74	Yes	No	No
	1.60	26.8	37.0	0.10	0.27	208	208	1.7	355	1.1	0.50	111.23	1.6	FALSE	0.5	111.2	1.6	1.0	63	63	0.103	208	208	1.00	0.17	1.00	1.19	0.73	Yes	No	No
	1.80	26.6	35.2	0.10	0.29	234	234	1.7	300	1.2	0.50	99.72	1.6	FALSE	0.5	99.7	1.6	1.0	60	60	0.100	234	234	1.00	0.17	1.00	1.19	0.70	Yes	No	No
	2.00	26.4	34.0	0.14	0.41	260	260	1.7	261	1.3	0.50	91.33	1.7	FALSE	0.5	91.3	1.7	1.1	58	61	0.101	260	260	1.00	0.17	1.00	1.19	0.71	Yes	No	No
	2.10	26.3	35.7	0.10	0.28	273	273	1.7	261	1.2	0.50	93.58	1.6	FALSE	0.5	93.6	1.6	1.0	61	61	0.101	273	273	1.00	0.17	1.00	1.19	0.71	Yes	No	No
	2.30	26.1	37.7	0.10	0.27	299	299	1.7	251	1.2	0.50	94.42	1.6	FALSE	0.5	94.4	1.6	1.0	64	64	0.104	299	299	0.99	0.17	1.00	1.19	0.74	Yes	No	No
	2.50	25.9	38.6	0.10	0.26	325	325	1.7	237	1.3	0.50	92.70	1.6	FALSE	0.5	92.7	1.6	1.0	66	66	0.106	325	325	0.99	0.17	1.00	1.19	0.75	Yes	No	No
	2.60	25.8	37.9	0.10	0.27	338	338	1.7	223	1.3	0.50	89.23	1.7	FALSE	0.5	89.2	1.7	1.0	64	65	0.105	338	338	0.99	0.17	1.00	1.19	0.74	Yes	No	No
	2.80	25.6	38.0	0.10	0.26	364	364	1.7	208	1.3	0.50	86.18	1.7	FALSE	0.5	86.2	1.7	1.0	65	65	0.106	364	364	0.99	0.17	1.00	1.19	0.75	Yes	No	No
	3.00	25.4	38.3	0.20	0.52	390	390	1.7	195	1.5	0.50	83.89	1.8	FALSE	0.5	83.9	1.8	1.1	65	73	0.115	390	390	0.99	0.17	1.00	1.19	0.81	Yes	No	No
	3.10	25.3	37.9	0.20	0.53	403	403	1.7	187	1.5	0.50	81.65	1.8	FALSE	0.5	81.6	1.8	1.1	64	72	0.115	403	403	0.99	0.17	1.00	1.19	0.81	Yes	No	No
	3.30	25.1	36.6	0.20	0.55	429	429	1.7	170	1.6	0.50	76.38	1.9	FALSE	0.5	76.4	1.9	1.1	62	71	0.114	429	429	0.99	0.17	1.00	1.19	0.80	Yes	No	No
	3.40	25.0	34.4	0.20	0.59	442	442	1.7	155	1.6	0.50	70.68	1.9	FALSE	0.5	70.7	1.9	1.2	58	69	0.111	442	442	0.99	0.17	1.00	1.19	0.78	Yes	No	No
	3.60	24.8	30.8	0.20	0.65	468	468	1.7	131	1.7	0.50	61.43	2.0	FALSE	0.5	61.4	2.0	1.3	52	66	0.107	468	468	0.99	0.17	1.00	1.19	0.76	Yes	No	No
	3.80	24.6	31.2	0.30	0.97	494	494	1.7	125	1.8	0.50	60.55	2.1	FALSE	0.5	60.5	2.1	1.4	53	75	0.119	494	494	0.99	0.17	1.00	1.19	0.84	Yes	No	No
	3.90	24.5	28.1	0.40	1.44	507	507	1.7	110	2.0	0.50	53.77	2.2	FALSE	0.5	53.8	2.2	1.7	48	82	0.131	507	507	0.99	0.17	1.00	1.19	0.93	Yes	No	No
	4.10	24.3	22.1	0.50	2.29	533	533	1.7	82	2.2	0.50	41.12	2.4	FALSE	0.5	41.1	2.4	2.5	38	93	0.154	533	533	0.99	0.17	1.00	1.19	1.09	Yes	No	No
	4.30	24.1	19.3	0.40	2.10	559	559	1.7	68	2.2	0.50	34.98	2.5	FALSE	0.5	35.0	2.5	2.6	33	86	0.138	559	559	0.99	0.17	1.00	1.19	0.98	Yes	No	No
	4.40	24.0	20.6	0.40	1.97	572	572	1.7	71	2.2	0.50	36.93	2.4	FALSE	0.5	36.9	2.4	2.4	35	86	0.138	572	572	0.99	0.17	1.00	1.19	0.98	Yes	No	No
	4.60	23.8	22.9	0.30	1.33	598	598	1.7	76	2.1	0.50	40.18	2.3	FALSE	0.5	40.2	2.3	1.9	39	76	0.120	598	598	0.99	0.17	1.00	1.19	0.85	Yes	No	No
	4.80	23.6	30.0	0.30	1.01	624	624	1.7	95	1.9	0.50	51.67	2.1	FALSE	0.5	51.7	2.1	1.5	51	78	0.125	624	624	0.99	0.17	1.00	1.19	0.88	Yes	No	No
	4.90	23.5	34.7	0.30	0.87	637	637	1.7	108	1.8	0.50	59.23	2.1	FALSE	0.5	59.2	2.1	1.4	59	81	0.130	637	637	0.99	0.17	1.00	1.19	0.92	Yes	No	No
	5.10	23.3	41.9	0.40	0.96	663	663	1.7	125	1.8	0.50	70.19	2.0	FALSE	0.5	70.2	2.0	1.3	71	95	0.159	663	663	0.99	0.17	1.00	1.19	1.13	Yes	No	No
	5.20	23.2	60.7	0.50	0.83	676	676	1.7	179	1.7	0.50	100.9	1.9	FALSE	0.5	100.9	1.9	1.1	103	119	0.235	676	676	0.99	0.17	1.00	1.19	1.67	Yes	No	No
	5.40	23.0	69.0	0.60	0.87	702	702	1.7	196	1.7	0.50	112.65	1.8	FALSE	0.5	112.7	1.8	1.1	117	133	0.298	702	702	0.99	0.17	1.00	1.19	2.11	Yes	No	No
	5.60	22.8	64.2	0.60	0.94	728	728	1.7	175	1.7	0.50	102.87	1.9	FALSE	0.5	102.9	1.9	1.2	109	128	0.276	728	728	0.99	0.17	1.00	1.19	1.96	Yes	No	No
	5.70	22.7	52.8	0.50	0.95	741	741	1.7	142	1.8	0.50	83.74	2.0	FALSE	0.5	83.7	2.0	1.2	89	111	0.208	741	741	0.99	0.17	1.00	1.19	1.48	Yes	No	No
	5.90	22.5	39.1	0.40	1.03	767	767	1.7	101	1.9	0.50	60.78	2.1	FALSE	0.5	60.8	2.1	1.4	65	93	0.155	767	767	0.99	0.17	1.00	1.19	1.10	Yes	No	No
	6.10	22.3	30.1	0.30	1.01	793	793	1.6	75	2.0	0.50	45.86	2.2	FALSE	0.5	45.9	2.2	1.6	49	80	0.128	793	793	0.99	0.17	1.00	1.19	0.91	Yes	No	No
	6.20	22.2	28.0	0.20	0.72	806	806	1.6	68	2.0	0.50	42.26	2.1	FALSE	0.5	42.3	2.1	1.5	45	69	0.111	806	806	0.99	0.17	1.00	1.19	0.79	Yes	No	No
	6.40	22.0	25.3	0.20	0.80	832	832	1.6	60	2.0	0.50	37.51	2.2	FALSE	0.5	37.5	2.2	1.7	40	68	0.109	832	832	0.99	0.17	1.00	1.19	0.77	Yes	No	No
	6.60	21.8	22.5	0.30	1.36	858	858	1.6	51	2.2	0.50	32.76	2.4	FALSE	0.5	32.8	2.4	2.2	35	79	0.125	858	858	0.98	0.17	1.00	1.19	0.89	Yes	No	No
	6.70	21.7	21.4	0.40	1.91	871	871	1.6	48	2.3	0.50	30.88	2.5	FALSE	0.5	30.9	2.5	2.7	33	90	0.147	871	871	0.98	0.17	1.00	1.19	1.05	Yes	No	No
	6.90	21.5	20.8	0.30	1.47	897	897	1.5	45	2.3	0.50	29.54	2.4	FALSE	0.5	29.5	2.4	2.5	32	79	0.125	897	897	0.98	0.17	1.00	1.19	0.89	Yes	No	No
	7.10	21.3	20.6	0.20	0.99	923	923	1.5	44	2.2	0.50	28.82	2.3	FALSE	0.5	28.8	2.3	2.1	31	66	0.107	923	923	0.98	0.17	1.00	1.19	0.76	Yes	No	No
	7.20	21.2	20.3	0.10	0.50	936	936	1.5	42	2.1	0.50	28.18	2.2	FALSE	0.5	28.2	2.2	1.7	31	52	0.093	936	936	0.98	0.17	1.00	1.19	0.67	Yes	No	No
	7.40	21.0	20.2	0.10	0.51	962	962	1.5	41	2.1	0.50	27.64	2.2	FALSE	0.5	27.6	2.2	1.7	30	52	0.093	962	962	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	7.50	20.9	20.8	0.10	0.49	975	975	1.5	42	2.1	0.50	28.28	2.2	FALSE	0.5	28.3	2.2	1.7	31	52	0.093	975	975	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	7.70	20.7	20.5	0.20	1.00	1001	1001	1.5	40	2.2	0.50	27.48	2.4	FALSE	0.5	27.5	2.4	2.2	30	65	0.106	1001	1001	0.98	0.17	1.00	1.19	0.76	Yes	No	No
	7.90	20.5	19.8	0.10	0.52	1027	1027	1.4	38	2.1	0.50	26.17	2.3	FALSE	0.5	26.2	2.3	1.8	28	52	0.093	1027	1027	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	8.00	20.4	20.8	0.10	0.49	1040	1040	1.4	39	2.1	0.50	27.34	2.2	FALSE	0.5	27.3	2.2	1.7	30	52	0.093	1040	1040	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	8.20	20.2	20.5	0.10	0.50	1066	1066	1.4	37	2.1	0.50	26.59	2.2	FALSE	0.5	26.6	2.2	1.8	29	51	0.093	1066	1066	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	8.40	20.0	20.9	0.10	0.49	1092	1092	1.4	37	2.1	0.50	26.78	2.2	FALSE	0.5	26.8	2.2	1.8	29	51	0.092	1092	1092	0.98	0.17	1.00	1.19	0.66	Yes	No	No
	8.50	19.9	23.1	0.10	0.44	1105	1105	1.4	41	2.1	0.50	29.49	2.2	FALSE	0.5	29.5	2.2	1.6	32	52	0.093	1104	1099	0.98	0.17	1.00	1.19	0.66	Yes	Yes	Yes
	8.70	19.7	24.2	0.10	0.42	1131	1131	1.4	42	2.0	0.50	30.56	2.2	FALSE	0.5	30.6	2.2	1.6	33	52	0.093	1128	1112	0.98	0.17	1.00	1.19	0.66	Yes	Yes	Yes
	8.90	19.5	25.8	0.10	0.40	1157	1157	1.4	44	2.0	0.50	32.24	2.1	FALSE	0.5	32.2	2.1	1.5	35	52	0.093	1152	1126	0.98	0.17	1.00	1.19	0.65	Yes	Yes	Yes
	9.00	19.4	28.8	0.10	0.35	1170	1170	1.3	48	1.9	0.50	35.86	2.1	FALSE	0.5	35.9	2.1	1.4	39	54	0.095	1164	1133	0.98	0.17	1.00	1.19	0.66	Yes	Yes	Yes
	9.20	19.2	30.8	0.20	0.66	1196	1196	1.3	51	2.1	0.50	37.97	2.2	FALSE	0.5	38.0	2.2	1.6	41	64	0.105	1188	1146	0.98	0.17	1.00	1.19	0.72	Yes	Yes	Yes
	9.40	19.0	33.0	0.20	0.62	1222	1222	1.3	53	2.0	0.50	40.28	2.1	FALSE	0.5	40.3	2.1	1.5	43	65	0.105	1212	1160	0.98	0.17	1.00	1.19	0.72	Yes	Yes	Yes
	9.50	18.9	34.7	0.20	0.59	1235	1235	1.3	55	2.0	0.50	42.17	2.1	FALSE	0.5	42.2	2.1	1.4	45	66	0.106	1224	1166	0.98	0.17	1.00	1.19	0.72	Yes	Yes	Yes
	9.70	18.7	35.2	0.20	0.58	1261	1261	1.3	55	2.0	0.50	42.33	2.1	FALSE	0.5	42.3	2.1	1.4	46	65	0.106	1248	1180	0.98	0.18	1.00	1.19	0.72	Yes	Yes	Yes
	9.80	18.6	38.0	0.20	0.54	1274	1274	1.3	59	1.9	0.50	45.51	2.0	FALSE	0.5	45.5	2.0	1.4	49	67	0.108	1260	1187	0.98	0.18	1.00	1.19	0.73	Yes	Yes	Yes
	10.00	18.4	40.3	0.30	0.76	1300	1300	1.3	61	2.0	0.50	47.81	2.1	FALSE	0.5	47.8	2.1	1.5	51	75	0.119	1284	1200	0.98	0.18	1.00	1.19	0.80	Yes	Yes	Yes
	10.20	18.2	38.4	0.30	0.79	1326	1326	1.3	57	2.0	0.50	45.06	2.1	FALSE	0.5	45.1	2.1	1.5	49	74	0.117	1308	1214	0.98	0.18	1.00	1.19	0.78	Yes	Yes	Yes
	10.30	18.1	34.0	0.30	0.90	1339	1339	1.3	50	2.1	0.50	39.60	2.2	FALSE	0.5	39.6	2.2	1.7	43	72	0.115	1320	1220	0.98	0.18	1.00	1.19	0.76	Yes	Yes	Yes
	10.50	17.9	31.2	0.20	0.66	1365	1365	1.2	45	2.1	0.50	35.91	2.2	FALSE	0.5	35.9	2.2	1.6	39	63	0.103	1344	1234	0.98	0.18	1.00	1.19	0.68	Yes	Yes	Yes
WM0004_015C	10.70	17.7	28.9	0.20	0.71	1391	1391	1.2	41	2.1	0.50	32.88	2.2	FALSE	0.5	32.9	2.2	1.7	36	62	0.102	1368	1247	0.98	0.18	1.00	1.19	0.67	Yes	Yes	Yes
	10.80	17.6	27.5	0.20	0.75	1404	1404	1.2	38	2.2	0.50	31.10	2.3	FALSE	0.5	31.1	2.3	1.8	34	62	0.102	1380	1254	0.97	0.18	1.00	1.19	0.66	Yes	Yes	Yes
	11.00	17.4	27.3	0.20	0.75	1430	1430	1.2	37	2.2	0.50	30.57	2.3	FALSE	0.5	30.6	2.3	1.8	33	61	0.102	1404	1268	0.97	0.18	1.00	1.19	0.66	Yes	Yes	Yes
	11.20	17.2	26.8	0.20	0.77	1456	1456	1.2	36	2.2	0.50	29.71	2.3	FALSE	0.5	29.7	2.3	1.9	32	61	0.101	1428	1281	0.97	0.18	1.00	1.19	0.65	Yes	Yes	Yes
	11.30	17.1	25.9	0.20	0.79	1469	1469	1.2	34	2.2	0.50	28.55	2.3	FALSE	0.5	28.5	2.3	2.0	31	61	0.101	1440	1288	0.97	0.19	1.00	1.19	0.65	Yes	Yes	Yes
	11.50	16.9	25.1	0.20	0.82	1495	1495	1.2	33	2.3	0.50	27.38	2.3	FALSE	0.5	27.4	2.3	2.0	30	61	0.101	1464	1302	0.97	0.19	1.00	1.19	0.65	Yes	Yes	Yes
	11.60	16.8	25.2	0.20	0.82	1508	1508	1.2	32	2.3	0.50	27.37	2.3	FALSE	0.5	27.4	2.3	2.0	30	61	0.101	1476	1308	0.97	0.19	1.00	1.19	0.64	Yes	Yes	Yes
	11.80	16.6	24.9	0.20	0.83	1534	1534	1.2	31	2.3	0.50	26.79	2.3	FALSE	0.5	26.8	2.3	2.1	29	61	0.101	1500	1322	0.97	0.19	1.00	1.19	0.64	Yes	Yes	Yes
	12.00	16.4	23.4	0.20	0.88	1560	1560	1.2	29	2.3	0.50	24.90	2.4	FALSE	0.5	24.9	2.4	2.2	27	61	0.101	1524	1335	0.97	0.19	1.00	1.19	0.64	Yes	Yes	Yes
	12.10	16.3	22.2	0.20	0.93	1573	1573	1.2	27	2.4	0.50	23.47	2.4	FALSE	0.5	23.5	2.4	2.4	26	61	0.101	1536	1342	0.97	0.19	1.00	1.19	0.64	Yes	Yes	Yes
	12.30	16.1	24.9	0.20	0.83	1599	1599	1.2	30	2.3	0.50	26.20	2.3	FALSE	0.5	26.2	2.3	2.1	29	60	0.100	1560	1356	0.97	0.19	1.00	1.19	0.63	Yes	Yes	Yes
	12.50	15.9	28.3	0.20	0.73	1625	1625	1.1	34	2.2	0.50	29.65	2.3	FALSE	0.5	29.6	2.3	1.9	32	60	0.100	1584	1369	0.97	0.19	1.00	1.19	0.63	Yes	Yes	Yes
	12.60	15.8	26.8	0.10	0.38	1638	1638	1.1	32	2.1	0.50	27.91	2.2	FALSE	0.5	27.9	2.2	1.6	30	49	0.091	1596	1376	0.97	0.19	1.00	1.19	0.57	Yes	Yes	Yes
	12.80	15.6	25.9	0.10	0.40	1664	1664	1.1	30	2.2	0.50	26.72	2.2	FALSE	0.5	26.7	2.2	1.7	29	49	0.091	1620	1389	0.97	0.19	1.00	1.19	0.56	Yes	Yes	Yes
	13.00	15.4	25.8	0.10	0.40	1690	1690	1.1	30	2.2	0.50	26.39	2.2	FALSE	0.5	26.4	2.2	1.7	29	49	0.091	1644	1403	0.97	0.19	1.00	1.19	0.56	Yes	Yes	Yes
	13.10	15.3	24.8	0.10	0.42	1703	1703	1.1	28	2.2	0.50	25.23	2.2	FALSE	0.5	25.2	2.2	1.7	28	48	0.090	1656	1410	0.97	0.19	1.00	1.19	0.56	Yes	Yes	Yes
	13.30	15.1	24.2	0.10	0.43	1729	1729	1.1	27	2.2	0.50	24.40	2.3	FALSE	0.5	24.4	2.3	1.8	27	48	0.090	1680	1423	0.97	0.19	1.00	1.19	0.55	Yes	Yes	Yes
	13.50	14.9	25.8	0.20	0.80	1755	1755	1.1	28	2.3	0.50	25.87	2.3	FALSE	0.5	25.9	2.3	2.1	28	59	0.100	1704	1437	0.97	0.20	1.00	1.19	0.61	Yes	Yes	Yes

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude Kσ	MSF	Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
	13.60	14.8	27.9	0.20	0.74	1768	1768	1.1	31	2.3	0.50	27.94	2.3	FALSE	0.5	27.9	2.3	1.9	31	59	0.099	1716	1444	0.97	0.20	1.00	1.19	0.60	Yes	Yes	Yes
	13.80	14.6	30.8	0.20	0.67	1794	1794	1.1	33	2.2	0.50	30.70	2.2	FALSE	0.5	30.7	2.2	1.8	33	59	0.099	1740	1457	0.97	0.20	1.00	1.19	0.60	Yes	Yes	Yes
	13.90	14.5	33.5	0.30	0.92	1807	1807	1.1	36	2.2	0.50	33.34	2.3	FALSE	0.5	33.3	2.3	1.9	36	68	0.110	1752	1464	0.97	0.20	1.00	1.19	0.66	Yes	Yes	Yes
	14.10	14.3	29.6	0.20	0.70	1833	1833	1.1	31	2.2	0.50	29.13	2.3	FALSE	0.5	29.1	2.3	1.9	32	59	0.099	1776	1477	0.97	0.20	1.00	1.19	0.60	Yes	Yes	Yes
	14.30	14.1	27.3	0.20	0.76	1859	1859	1.1	28	2.3	0.50	26.59	2.3	FALSE	0.5	26.6	2.3	2.0	29	59	0.099	1800	1491	0.97	0.20	1.00	1.19	0.59	Yes	Yes	Yes
	14.40	14.0	26.2	0.20	0.79	1872	1872	1.1	27	2.3	0.50	25.39	2.3	FALSE	0.5	25.4	2.3	2.1	28	59	0.099	1812	1498	0.97	0.20	1.00	1.19	0.59	Yes	Yes	Yes
	14.60	13.8	28.0	0.20	0.74	1898	1898	1.1	29	2.3	0.50	27.00	2.3	FALSE	0.5	27.0	2.3	2.0	30	59	0.099	1836	1511	0.97	0.20	1.00	1.19	0.59	Yes	Yes	Yes
	14.80	13.6	29.6	0.20	0.70	1922	1910	1.1	30	2.3	0.50	28.49	2.3	FALSE	0.5	28.5	2.3	1.9	31	59	0.099	1860	1523	0.97	0.20	1.00	1.19	0.59	Yes	Yes	Yes
	14.90	13.5	32.1	0.20	0.64	1934	1915	1.1	33	2.2	0.50	30.93	2.2	FALSE	0.5	30.9	2.2	1.7	34	59	0.099	1872	1528	0.97	0.20	1.00	1.19	0.59	Yes	Yes	Yes
	15.10	13.3	32.1	0.20	0.64	1958	1927	1.0	32	2.2	0.50	30.83	2.2	FALSE	0.5	30.8	2.2	1.7	34	59	0.099	1896	1540	0.96	0.20	1.00	1.19	0.58	Yes	Yes	Yes
	15.30	13.1	30.1	0.20	0.69	1982	1938	1.0	30	2.3	0.50	28.75	2.3	FALSE	0.5	28.7	2.3	1.9	31	59	0.099	1920	1551	0.96	0.20	1.00	1.19	0.58	Yes	Yes	Yes
	15.40	13.0	30.8	0.20	0.67	1994	1944	1.0	31	2.2	0.50	29.39	2.3	FALSE	0.5	29.4	2.3	1.8	32	59	0.099	1932	1557	0.96	0.20	1.00	1.19	0.58	Yes	Yes	Yes
	15.60	12.8	31.8	0.20	0.65	2018	1956	1.0	31	2.2	0.50	30.27	2.2	FALSE	0.5	30.3	2.2	1.8	33	59	0.099	1956	1569	0.96	0.20	1.00	1.19	0.58	Yes	Yes	Yes
	15.70	12.7	30.2	0.20	0.69	2030	1961	1.0	30	2.3	0.50	28.65	2.3	FALSE	0.5	28.7	2.3	1.9	31	58	0.099	1968	1574	0.96	0.21	1.00	1.19	0.57	Yes	Yes	Yes
	15.90	12.5	27.5	0.20	0.76	2054	1973	1.0	27	2.3	0.50	25.91	2.3	FALSE	0.5	25.9	2.3	2.1	28	58	0.099	1992	1586	0.96	0.21	1.00	1.19	0.57	Yes	Yes	Yes
	16.10	12.3	27.7	0.20	0.75	2078	1984	1.0	27	2.3	0.50	26.02	2.3	FALSE	0.5	26.0	2.3	2.0	29	58	0.099	2016	1598	0.96	0.21	1.00	1.19	0.57	Yes	Yes	Yes
	16.20	12.2	25.9	0.40	1.61	2090	1990	1.0	25	2.5	0.50	24.22	2.5	FALSE	0.5	24.2	2.5	2.9	27	78	0.124	2028	1603	0.96	0.21	1.00	1.19	0.71	Yes	Yes	Yes
	16.40	12.0	20.5	0.40	2.06	2114	2002	1.1	19	2.7	1.00	19.43	2.7	FALSE	1.0	19.4	2.7	3.8	22	81		2052	1615	0.96	0.21	1.00	1.19	100.00	No	Yes	No
	16.60	11.8	24.8	0.40	1.69	2138	2013	1.0	24	2.5	0.50	23.00	2.6	FALSE	0.5	23.0	2.6	3.1	25	78	0.124	2076	1626	0.96	0.21	1.00	1.19	0.71	Yes	Yes	Yes
	16.70	11.7	31.7	0.40	1.31	2150	2019	1.0	30	2.4	0.50	29.63	2.4	FALSE	0.5	29.6	2.4	2.3	32	76	0.120	2088	1632	0.96	0.21	1.00	1.19	0.68	Yes	Yes	Yes
	16.90	11.5	27.6	0.40	1.51	2174	2030	1.0	26	2.5	0.50	25.58	2.5	FALSE	0.5	25.6	2.5	2.7	28	77	0.122	2112	1644	0.96	0.21	1.00	1.19	0.69	Yes	Yes	Yes
	17.10	11.3	28.0	0.30	1.12	2198	2042	1.0	26	2.4	0.50	25.88	2.4	FALSE	0.5	25.9	2.4	2.4	29	68	0.109	2136	1655	0.96	0.21	1.00	1.19	0.62	Yes	Yes	Yes
	17.20	11.2	28.2	0.30	1.11	2210	2048	1.0	26	2.4	0.50	26.03	2.4	FALSE	0.5	26.0	2.4	2.4	29	68	0.109	2148	1661	0.96	0.21	1.00	1.19	0.61	Yes	Yes	Yes
	17.40	11.0	29.1	0.30	1.07	2234	2059	1.0	27	2.4	0.50	26.81	2.4	FALSE	0.5	26.8	2.4	2.3	29	68	0.109	2172	1672	0.96	0.21	1.00	1.19	0.61	Yes	Yes	Yes
	17.60	10.8	29.4	0.20	0.71	2258	2071	1.0	27	2.3	0.50	27.01	2.3	FALSE	0.5	27.0	2.3	2.0	30	58	0.098	2196	1684	0.96	0.21	1.00	1.19	0.55	Yes	Yes	Yes
	17.70	10.7	27.7	0.30	1.13	2270	2077	1.0	26	2.4	0.50	25.35	2.4	FALSE	0.5	25.3	2.4	2.4	28	68	0.109	2208	1690	0.96	0.21	1.00	1.19	0.61	Yes	Yes	Yes
	17.90	10.5	21.7	0.40	1.95	2294	2088	1.0	20	2.6	1.00	19.69	2.6	FALSE	1.0	19.7	2.6	3.6	22	80		2232	1701	0.96	0.21	1.00	1.19	100.00	No	Yes	No
	18.00	10.4	14.9	0.30	2.18	2306	2094	1.0	13	2.8	1.00	13.13	2.8	FALSE	1.0	13.1	2.8	5.0	15	75		2244	1707	0.96	0.21	1.00	1.19	100.00	No	Yes	No
	18.20	10.2	10.6	0.30	3.18	2330	2105	1.0	9	3.1	1.00	8.96	3.1	FALSE	1.0	9.0	3.1	7.3	11	78		2268	1718	0.96	0.22	1.00	1.19	100.00	No	Yes	No
	18.40	10.0	13.1	0.30	2.52	2354	2117	1.0	11	2.9	1.00	11.26	2.9	FALSE	1.0	11.3	2.9	5.8	13	76		2292	1730	0.96	0.22	1.00	1.19	100.00	No	Yes	No
	18.50	9.9	17.2	0.40	2.50	2366	2123	1.0	15	2.8	1.00	15.09	2.8	FALSE	1.0	15.1	2.8	4.8	17	83		2304	1736	0.96	0.22	1.00	1.19	100.00	No	Yes	No
	18.70	9.7	19.7	0.40	2.16	2390	2134	1.0	17	2.7	1.00	17.34	2.7	FALSE	1.0	17.3	2.7	4.1	20	81		2328	1747	0.96	0.22	1.00	1.19	100.00	No	Yes	No
	18.90	9.5	20.3	0.40	2.10	2414	2146	1.0	18	2.7	1.00	17.80	2.7	FALSE	1.0	17.8	2.7	4.0	20	80		2352	1759	0.96	0.22	1.00	1.19	100.00	No	Yes	No
	19.00	9.4	16.8	0.30	1.92	2426	2151	1.0	14	2.8	1.00	14.49	2.8	FALSE	1.0	14.5	2.8	4.4	17	73		2364	1765	0.96	0.22	1.00	1.19	100.00	No	Yes	No
	19.20	9.2	18.0	0.20	1.19	2450	2163	1.0	16	2.6	1.00	15.51	2.6	FALSE	1.0	15.5	2.6	3.5	18	61		2388	1776	0.96	0.22	0.99	1.19	100.00	No	Yes	No
	19.40	9.0	19.4	0.30	1.65	2474	2174	1.0	17	2.7	1.00	16.71	2.7	FALSE	1.0	16.7	2.7	3.8	19	71		2412	1788	0.95	0.22	0.99	1.19	100.00	No	Yes	No
	19.50	8.9	20.7	0.40	2.06	2486	2180	1.0	18	2.7	1.00	17.85	2.7	FALSE	1.0	17.8	2.7	4.0	20	80		2424	1793	0.95	0.22	0.99	1.19	100.00	No	Yes	No
	19.70	8.7	32.3	0.40	1.29	2510	2192	1.0	28	2.4	0.50	28.83	2.4	FALSE	0.5	28.8	2.4	2.4	32	75	0.119	2448	1805	0.95	0.22	0.99	1.19	0.64	Yes	Yes	Yes
	19.80	8.6	43.0	0.30	0.72	2522	2198	1.0	38	2.2	0.50	38.71	2.2	FALSE	0.5	38.7	2.2	1.6	42	67	0.108	2460	1811	0.95	0.22	0.99	1.19	0.58	Yes	Yes	Yes
	20.00	8.4	44.8	0.20	0.46	2546	2209	1.0	39	2.1	0.50	40.27	2.1	FALSE	0.5	40.3	2.1	1.4	44	61	0.101	2484	1822	0.95	0.22	0.99	1.19	0.54	Yes	Yes	Yes
	20.20	8.2	40.3	0.30	0.77	2570	2221	1.0	35	2.2	0.50	36.00	2.2	FALSE	0.5	36.0	2.2	1.7	39	67	0.107	2508	1834	0.95	0.22	0.99	1.19	0.57	Yes	Yes	Yes
	20.30	8.1	36.5	0.20	0.57	2582	2226	1.0	32	2.2	0.50	32.44	2.2	FALSE	0.5	32.4	2.2	1.6	36	58	0.098	2520	1839	0.95	0.22	0.99	1.19	0.52	Yes	Yes	Yes
	20.50	7.9	33.3	0.20	0.63	2606	2238	1.0	29	2.3	0.50	29.41	2.2	FALSE	0.5	29.4	2.2	1.8	32	58	0.098	2544	1851	0.95	0.22	0.99	1.19	0.52	Yes	Yes	Yes
	20.70	7.7	29.6	0.20	0.71	2630	2249	1.0	25	2.3	0.50	25.93	2.3	FALSE	0.5	25.9	2.3	2.0	29	58	0.098	2568	1862	0.95	0.22	0.98	1.19	0.51	Yes	Yes	Yes
	20.80	7.6	26.7	0.30	1.18	2642	2255	1.0	23	2.5	0.50	23.24	2.5	FALSE	0.5	23.2	2.5	2.6	26	68	0.109	2580	1868	0.95	0.22	0.98	1.19	0.57	Yes	Yes	Yes
	21.00	7.4	17.8	0.30	1.82	2666	2267	0.9	15	2.7	1.00	14.53	2.7	FALSE	1.0	14.5	2.7	4.3	17	72		2604	1880	0.95	0.22	0.98	1.19	100.00	No	Yes	No
	21.20	7.2	11.0	0.20	2.07	2690	2278	0.9	8	3.0	1.00	8.48	3.0	FALSE	1.0	8.5	3.0	6.4	10	66		2628	1891	0.95	0.22	0.98	1.19	100.00	No	Yes	No
	21.30	7.1	9.1	0.10	1.29	2702	2284	0.9	7	3.0	1.00	6.79	3.0	FALSE	1.0	6.8	3.0	6.3	8	53		2640	1897	0.95	0.23	0.98	1.19	100.00	No	Yes	No
	21.50	6.9	8.7	0.20	2.73	2726	2295	0.9	6	3.1	1.00	6.39	3.1	FALSE	1.0	6.4	3.1	8.4	8	67		2664	1909	0.95	0.23	0.98	1.19	100.00	No	Yes	No
	21.70	6.7	10.8	0.20	2.12	2750	2307	0.9	8	3.0	1.00	8.17	3.0	FALSE	1.0	8.2	3.0	6.6	10	66		2688	1920	0.95	0.23	0.98	1.19	100.00	No	Yes	No
	21.80	6.6	19.1	0.30	1.69	2762	2313	0.9	15	2.7	1.00	15.32	2.7	FALSE	1.0	15.3	2.7	4.0	17	71		2700	1926	0.95	0.23	0.98	1.19	100.00	No	Yes	No
	22.00	6.4	18.0	0.30	1.81	2786	2324	0.9	14	2.7	1.00	14.29	2.7	FALSE	1.0	14.3	2.7	4.3	16	71		2724	1937	0.95	0.23	0.98	1.19	100.00	No	Yes	No
	22.10	6.3	21.7	0.20	0.99	2798	2330	1.0	17	2.5	0.50	18.29	2.5	FALSE	0.5	18.3	2.5	2.9	21	59	0.099	2736	1943	0.95	0.23	0.98	1.19	0.51	Yes	Yes	Yes
	22.30	6.1	19.8	0.30	1.63	2822	2342	0.9	16	2.7	1.00	15.71	2.7	FALSE	1.0	15.7	2.7	3.9	18	70		2760	1955	0.95	0.23	0.97	1.19	100.00	No	Yes	No
	22.50	5.9	14.3	0.20	1.55	2846	2353	0.9	11	2.8	1.00	10.94	2.8	FALSE	1.0	10.9	2.8	4.9	13	63		2784	1966	0.95	0.23	0.97	1.19	100.00	No	Yes	No
	22.60	5.8	22.6	0.20	0.94	2858	2359	0.9	18	2.5	0.50	18.95	2.5	FALSE	0.5	19.0	2.5	2.8	21	59	0.099	2796	1972	0.95	0.23	0.97	1.19	0.50	Yes	Yes	Yes
	22.80	5.6	33.3	0.20	0.63	2882	2370	0.9	27	2.3	0.50	28.45	2.3	FALSE	0.5	28.5	2.3	1.8	31	57	0.098	2820	1983	0.95	0.23	0.97	1.19	0.49	Yes	Yes	Yes
	23.00	5.4	45.2	0.20	0.46	2906	2382	0.9	37	2.1	0.50	38.97	2.1	FALSE	0.5	39.0	2.1	1.4	43	60	0.100	2844	1995	0.95	0.23	0.97	1.19	0.51	Yes	Yes	Yes
	23.10	5.3	47.9	0.20	0.43	2918	2388	0.9	39	2.1	0.50	41.32	2.0	FALSE	0.5	41.3	2.0	1.4	45	61	0.101	2856	2001	0.95	0.23	0.97	1.19	0.51	Yes	Yes	Yes
	23.30	5.1	47.3	0.30	0.65	2942	2399	0.9	38	2.2	0.50	40.68	2.1	FALSE	0.5	40.7	2.1	1.5	44	67	0.108	2880	2012	0.95	0.23	0.97	1.19	0.54	Yes	Yes	Yes
	23.50	4.9	42.5	0.40	0.98	2966	2411	0.9	34	2.3	0.50	36.32	2.3	FALSE	0.5	36.3	2.3	1.8	40	73	0.116	2904	2024	0.95	0.23	0.97	1.19	0.58	Yes	Yes	Yes
	23.60	4.8	30.7	0.60	2.05	2978	2416	0.9	24	2.6	0.50	25.84	2.6	FALSE	0.5	25.8	2.6	3.1	29	90	0.147	2916	2030	0.94	0.23	0.97	1.19	0.73	Yes	Yes	Yes
	23.80	4.6	21.7	0.70	3.47	3002	2428	0.9	17	2.9	1.00	16.64	2.9	FALSE	1.0	16.6	2.9	5.3	19	100		2940	2041	0.94	0.23	0.97	1.19	100.00	No	Yes	No
	24.00	4.4	18.5	0.50	2.94	3026	2439	0.9	14	2.9	1.00	13.93	2.9	FALSE	1.0	13.9	2.9	5.5	16	88		2964	2053	0.94	0.23	0.97	1.19	100.00	No	Yes	No
	24.10	4.3	15.9	0.50	3.48	3038	2445	0.9	12	3.0	1.00	11.76	3.0	FALSE	1.0	11.8	3.0	6.5	14	89		2976	2058	0.94	0.23	0.96	1.19	100.00	No	Yes	No
	24.30	4.1	15.4	0.50	3.61	3062	2457	0.9	11	3.0	1.00	11.29	3.0	FALSE	1.0	11.3	3.0	6.7	13	89		3000	2070	0.94	0.23	0.96	1.19	100.00	No	Yes	No
	24.40	4.0	13.2	0.40	3.43	3074	2462	0.9	9	3.0	1.00	9.47	3.0	FALSE	1.0	9.5	3.0	7.3	11	83		3012	2076	0.94	0.23	0.96	1.19	100.00	No	Yes	No
	24.60	3.8	12.8	0.30	2.67	3098	2474	0.9	9	3.0	1.00	9.10	3.0	FALSE	1.0	9.1	3.0	6.8	11	74		3036	2087	0.94	0.23	0.96	1.19	100.00	No	Yes	No
	24.80	3.6	8.9	0.40	5.45	3122	2486	0.9	6	3.3	1.00	5.91	3.3	FALSE	1.0	5.9	3.3	11.2	8	85		3060	2099	0.94	0.23	0.96	1.19	100.00	No	Yes	No
	24.90	3.5	20.8	0.30	1.56	3134	2491	0.8	15	2.7	1.00	15.44	2.7	FALSE	1.0	15.4	2.7	3.9	18	69		3072	2104	0.94	0.23	0.96	1.19	100.00	No	Yes	No
	25.10	3.3	41.3	0.30	0.76	3158	2503	0.9	32	2.3	0.50	34.52	2.2	FALSE	0.5	34.5	2.2	1.7	38	65	0.106	3096	2116	0.94	0.23	0.96	1.19	0.52	Yes	Yes	Yes
	25.30	3.1	46.5	0.30	0.67	3182	2514	0.9	36	2.2	0.50	38.94	2.2	FALSE	0.5	38.9	2.2	1.6	43	66	0.107	3120	2127	0.94	0.24	0.96	1.19	0.52	Yes	Yes	Yes
	25.40	3.0	47.1	0.30	0.66	3194	2520	0.9	36	2.2	0.50	39.41	2.1	FALSE	0.5	39.4	2.1	1.5	43	66	0.107	3132	2133	0.94	0.24	0.96	1.19	0.52	Yes	Yes	Yes
	25.60	2.8	47.4	0.30	0.66	3218	2532	0.9	36	2.2	0.50	39.57	2.1	FALSE	0.5	39.6	2.1	1.5	43	66	0.107	3156	2145	0.94	0.24	0.96	1.19	0.52	Yes	Yes	Yes
	25.80	2.6	46.2	0.10	0.22	3242	2543	0.9	35	2.0	0.50	38.43	2.0	FALSE	0.5	38.4	2.0	1.3	42	53	0.094	3180	2156	0.94	0.24	0.96	1.19	0.45	Yes	Yes	Yes
	25.90	2.5	38.2	0.40	1.09	3254	2549	0.9	29	2.4	0.50	31.50	2.3	FALSE	0.5	31.5	2.3	2.1	35	72	0.115	3192	2162	0.94	0.24	0.95	1.19	0.56	Yes	Yes	Yes
	26.10	2.3	25.1	0.50	2.13	3278	2560	0.8	18	2.7	1.00	18.33	2.7	FALSE	1.0	18.3	2.7	4.0	21	82		3216	2174	0.94	0.24	0.95	1.19	100.00	No	Yes	No
	26.20	2.2	18.6	0.60	3.54	3290	2566	0.8	13	2.9	1.00	13.21	2.9	FALSE	1.0	13.2	2.9	6.1	15	94		3228	2179	0.94	0.24	0.95	1.19	100.00	No	Yes	No
	26.40	2.0	13.5	0.60	5.07	3314	2578	0.8	9	3.2	1.00	9.19	3.2	FALSE	1.0	9.2	3.2	8.7	11	97		3252	2191	0.94	0.24	0.95	1.19	100.00	No	Yes	No
	26.60	1.8	10.8	0.30	3.29	3338	2589	0.8	7	3.1	1.00	7.05	3.1	FALSE	1.0	7.1	3.1	8.5	9	75		3276	2202	0.94	0.24	0.95	1.19	100.00	No	Yes	No
	26.70	1.7	25.0	0.20	0.86	3350	2595	0.9	18	2.5	0.50	19.91	2.5	FALSE	0.5	19.9	2.5	2.6	23	58	0.098	3288	2208	0.94	0.24	0.95	1.19	0.47	Yes	Yes	Yes
	26.90	1.5	22.2	0.20	0.97	3374	2606	0.9	16	2.6	0.50	17.47	2.5	FALSE	0.5	17.5	2.5	2.9	20	59	0.099	3312	2220	0.94	0.24	0.95	1.19	0.47	Yes	Yes	Yes
	27.10	1.3	15.0	0.30	2.26	3398	2618	0.8	10	2.9	1.00	10.16	2.9	FALSE	1.0	10.2	2.9	5.9	12	72		3336	2231	0.94	0.24	0.95	1.19	100.00	No	Yes	No
	27.20	1.2	11.5	0.30	3.06	3410	2624	0.8	7	3.1	1.00	7.47	3.1	FALSE	1.0	7.5	3.1	8.0	9	74		3348	2237	0.94	0.24	0.95	1.19	100.00	No	Yes	No
	27.40	1.0	12.9	0.40	3.58	3434	2635	0.8	8	3.1	1.00	8.49	3.1	FALSE	1.0	8.5	3.1	7.9	10	82		3372	2248	0.94	0.24	0.95	1.19	100.00	No	Yes	No
	27.60	0.8	25.4	0.30	1.27	3458	2647	0.9	18	2.6	0.50	20.00	2.5	FALSE	0.5	20.0	2.5	3.0	23	68	0.109	3396	2260	0.94	0.24	0.95	1.19	0.51	Yes	Yes	Yes
	27.70	0.7	43.9	0.20	0.47	3470	2653	0.9	32	2.2	0.50	35.60	2.1	FALSE	0.5	35.6	2.1	1.5	39	58	0.098	3408	2266	0.94	0.24	0.95	1.19	0.46	Yes	Yes	Yes
	27.90	0.5	46.7	0.20	0.44	3494	2664	0.9	34	2.1	0.50	37.87	2.1	FALSE	0.5	37.9	2.1	1.4	42	59	0.099	3432	2277	0.93	0.24	0.94	1.19	0.47	Yes	Yes	Yes
	28.10	0.3	47.3	0.20	0.44	3518	2676	0.9	34	2.1	0.50	38.28	2.1	FALSE	0.5	38.3	2.1	1.4	42	59	0.099	3456	2289	0.93	0.24	0.94	1.19	0.47	Yes	Yes	Yes
	28.20	0.2	47.0	0.20	0.44	3530	2681	0.9	34	2.1	0.50	37.98	2.1	FALSE	0.5	38.0	2.1	1.4	42	59	0.099	3468	2294	0.93	0.24	0.94	1.19	0.46	Yes	Yes	Yes
	28.40	0.0	46.1	0.20	0.45	3554	2693	0.9	33	2.1	0.50	37.14	2.1	FALSE	0.5	37.1	2.1	1.4	41	59	0.099	3492	2306	0.93	0.24	0.94	1.19	0.46	Yes	Yes	Yes
	28.50	-0.1	45.1	0.20	0.46	3566	2699	0.9	32	2.2	0.50	36.25	2.1	FALSE	0.5	36.3	2.1	1.5	40	58	0.099	3504	2312	0.93	0.24	0.94	1.19	0.46	Yes	Yes	Yes

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
	28.70	-0.3	45.5	0.30	0.69	3590	2710	0.9	32	2.2	0.50	36.50	2.2	FALSE	0.5	36.5	2.2	1.6	40	65	0.106	3528	2323	0.93	0.24	0.94	1.19	0.49	Yes	Yes	Yes
	28.90	-0.5	46.0	0.30	0.68	3614	2722	0.9	32	2.2	0.50	36.83	2.2	FALSE	0.5	36.8	2.2	1.6	41	65	0.106	3552	2335	0.93	0.24	0.94	1.19	0.49	Yes	Yes	Yes
	29.00	-0.6	52.1	0.30	0.60	3626	2727	0.9	37	2.1	0.50	41.86	2.1	FALSE	0.5	41.9	2.1	1.5	46	67	0.108	3564	2341	0.93	0.24	0.94	1.19	0.50	Yes	Yes	Yes
	29.20	-0.8	62.1	0.20	0.33	3650	2739	0.9	44	2.0	0.50	50.07	1.9	FALSE	0.5	50.1	1.9	1.2	55	66	0.107	3588	2352	0.93	0.24	0.94	1.19	0.49	Yes	Yes	Yes
	29.40	-1.0	73.0	0.20	0.28	3674	2750	0.9	52	1.9	0.50	59.00	1.8	FALSE	0.5	59.0	1.8	1.1	64	72	0.115	3612	2364	0.93	0.24	0.94	1.19	0.53	Yes	Yes	Yes
	29.50	-1.1	74.4	0.20	0.28	3686	2756	0.9	53	1.9	0.50	60.09	1.8	FALSE	0.5	60.1	1.8	1.1	65	73	0.116	3624	2369	0.93	0.24	0.94	1.19	0.53	Yes	Yes	Yes
	29.70	-1.3	80.9	0.30	0.38	3710	2768	0.9	57	1.9	0.50	65.33	1.8	FALSE	0.5	65.3	1.8	1.1	71	80	0.128	3648	2381	0.93	0.24	0.94	1.19	0.59	Yes	Yes	Yes
	29.90	-1.5	90.5	0.30	0.34	3734	2779	0.9	64	1.8	0.50	73.10	1.8	FALSE	0.5	73.1	1.8	1.1	79	86	0.139	3672	2392	0.93	0.24	0.93	1.19	0.64	Yes	Yes	Yes
	30.00	-1.6	96.4	0.40	0.42	3746	2785	0.9	68	1.8	0.50	77.88	1.8	FALSE	0.5	77.9	1.8	1.1	84	92	0.154	3684	2398	0.93	0.24	0.93	1.19	0.70	Yes	Yes	Yes
	30.20	-1.8	86.4	0.40	0.47	3770	2797	0.9	60	1.9	0.50	69.49	1.9	FALSE	0.5	69.5	1.9	1.2	75	87	0.140	3708	2410	0.93	0.24	0.93	1.19	0.64	Yes	Yes	Yes
	30.30	-1.9	79.1	0.40	0.52	3782	2802	0.9	55	2.0	0.50	63.41	1.9	FALSE	0.5	63.4	1.9	1.2	69	82	0.132	3720	2415	0.93	0.24	0.93	1.19	0.60	Yes	Yes	Yes
	30.50	-2.1	77.9	0.30	0.39	3806	2814	0.9	54	1.9	0.50	62.29	1.9	FALSE	0.5	62.3	1.9	1.2	68	78	0.124	3744	2427	0.93	0.24	0.93	1.19	0.57	Yes	Yes	Yes
	30.70	-2.3	78.1	0.30	0.39	3830	2825	0.9	54	1.9	0.50	62.32	1.9	FALSE	0.5	62.3	1.9	1.2	68	78	0.124	3768	2438	0.92	0.24	0.93	1.19	0.57	Yes	Yes	Yes
	30.80	-2.4	72.0	0.30	0.43	3842	2831	0.9	50	2.0	0.50	57.26	1.9	FALSE	0.5	57.3	1.9	1.2	62	75	0.119	3780	2444	0.92	0.24	0.93	1.19	0.54	Yes	Yes	Yes
	31.00	-2.6	66.2	0.30	0.47	3866	2843	0.9	45	2.0	0.50	52.41	2.0	FALSE	0.5	52.4	2.0	1.3	57	72	0.114	3804	2456	0.92	0.24	0.93	1.19	0.52	Yes	Yes	Yes
	31.20	-2.8	63.5	0.20	0.32	3890	2854	0.9	43	2.0	0.50	50.10	1.9	FALSE	0.5	50.1	1.9	1.2	55	66	0.107	3828	2467	0.92	0.24	0.93	1.19	0.48	Yes	Yes	Yes
	31.30	-2.9	63.5	0.20	0.32	3902	2860	0.9	43	2.0	0.50	50.04	1.9	FALSE	0.5	50.0	1.9	1.2	55	66	0.106	3840	2473	0.92	0.24	0.93	1.19	0.48	Yes	Yes	Yes
	31.50	-3.1	64.8	0.20	0.32	3926	2871	0.9	44	2.0	0.50	50.98	1.9	FALSE	0.5	51.0	1.9	1.2	56	66	0.107	3864	2485	0.92	0.24	0.93	1.19	0.49	Yes	Yes	Yes
	31.70	-3.3	67.4	0.30	0.46	3950	2883	0.9	45	2.0	0.50	52.98	2.0	FALSE	0.5	53.0	2.0	1.2	58	72	0.115	3888	2496	0.92	0.24	0.93	1.19	0.52	Yes	Yes	Yes
	31.80	-3.4	74.5	0.30	0.41	3962	2889	0.9	50	2.0	0.50	58.66	1.9	FALSE	0.5	58.7	1.9	1.2	64	76	0.120	3900	2502	0.92	0.24	0.93	1.19	0.55	Yes	Yes	Yes
	32.00	-3.6	84.6	0.30	0.36	3986	2900	0.9	57	1.9	0.50	66.69	1.8	FALSE	0.5	66.7	1.8	1.1	72	81	0.130	3924	2513	0.91	0.24	0.92	1.19	0.59	Yes	Yes	Yes
	32.20	-3.8	93.4	0.30	0.33	4010	2912	0.9	63	1.8	0.50	73.64	1.8	FALSE	0.5	73.6	1.8	1.1	80	86	0.139	3948	2525	0.91	0.24	0.92	1.19	0.63	Yes	Yes	Yes
	32.30	-3.9	104.5	0.30	0.29	4022	2918	0.9	70	1.8	0.50	82.50	1.7	FALSE	0.5	82.5	1.7	1.0	89	92	0.153	3960	2531	0.91	0.24	0.92	1.19	0.69	Yes	Yes	Yes
	32.50	-4.1	106.1	0.30	0.29	4046	2929	0.8	71	1.8	0.50	83.61	1.7	FALSE	0.5	83.6	1.7	1.0	90	93	0.155	3984	2542	0.91	0.24	0.92	1.19	0.70	Yes	Yes	Yes
	32.60	-4.2	105.2	0.30	0.29	4058	2935	0.8	70	1.8	0.50	82.80	1.7	FALSE	0.5	82.8	1.7	1.0	89	92	0.154	3996	2548	0.91	0.24	0.92	1.19	0.70	Yes	Yes	Yes
	32.80	-4.4	109.7	0.30	0.28	4082	2946	0.8	73	1.7	0.50	86.23	1.7	FALSE	0.5	86.2	1.7	1.0	93	95	0.159	4020	2559	0.91	0.24	0.92	1.19	0.72	Yes	Yes	Yes
	33.00	-4.6	108.5	0.30	0.28	4106	2958	0.8	72	1.7	0.50	85.10	1.7	FALSE	0.5	85.1	1.7	1.0	92	94	0.157	4044	2571	0.91	0.24	0.92	1.19	0.71	Yes	Yes	Yes
	33.10	-4.7	100.4	0.30	0.31	4118	2964	0.8	66	1.8	0.50	78.54	1.7	FALSE	0.5	78.5	1.7	1.1	85	89	0.147	4056	2577	0.90	0.24	0.92	1.19	0.66	Yes	Yes	Yes
	33.30	-4.9	100.4	0.30	0.31	4142	2975	0.8	66	1.8	0.50	78.38	1.7	FALSE	0.5	78.4	1.7	1.1	85	89	0.146	4080	2588	0.90	0.24	0.92	1.19	0.66	Yes	Yes	Yes
	33.50	-5.1	102.2	0.30	0.30	4166	2987	0.8	67	1.8	0.50	79.65	1.7	FALSE	0.5	79.7	1.7	1.0	86	90	0.148	4104	2600	0.90	0.24	0.92	1.19	0.67	Yes	Yes	Yes
	33.60	-5.2	93.4	0.30	0.33	4178	2992	0.8	61	1.8	0.50	72.57	1.8	FALSE	0.5	72.6	1.8	1.1	79	85	0.138	4116	2606	0.90	0.24	0.92	1.19	0.62	Yes	Yes	Yes
	33.80	-5.4	75.8	0.30	0.41	4202	3004	0.8	49	2.0	0.50	58.46	1.9	FALSE	0.5	58.5	1.9	1.2	64	75	0.120	4140	2617	0.90	0.24	0.92	1.19	0.54	Yes	Yes	Yes
	34.00	-5.6	58.4	0.20	0.36	4226	3015	0.8	37	2.0	0.50	44.57	2.0	FALSE	0.5	44.6	2.0	1.3	49	62	0.102	4164	2629	0.90	0.24	0.92	1.19	0.46	Yes	Yes	Yes
	34.10	-5.7	49.1	0.20	0.43	4238	3021	0.8	31	2.2	0.50	37.16	2.1	FALSE	0.5	37.2	2.1	1.4	41	58	0.099	4176	2634	0.90	0.24	0.91	1.19	0.44	Yes	Yes	Yes
	34.30	-5.9	44.6	0.20	0.47	4262	3033	0.8	28	2.2	0.50	33.53	2.1	FALSE	0.5	33.5	2.1	1.5	37	57	0.097	4200	2646	0.89	0.24	0.91	1.19	0.44	Yes	Yes	Yes
	34.40	-6.0	42.7	0.20	0.49	4274	3038	0.8	27	2.2	0.50	31.99	2.2	FALSE	0.5	32.0	2.2	1.6	36	57	0.097	4212	2652	0.89	0.24	0.91	1.19	0.44	Yes	Yes	Yes
	34.60	-6.2	41.2	0.10	0.26	4298	3050	0.8	26	2.2	0.50	30.74	2.1	FALSE	0.5	30.7	2.1	1.4	34	49	0.091	4236	2663	0.89	0.24	0.91	1.19	0.41	Yes	Yes	Yes
	34.80	-6.4	39.9	0.10	0.26	4322	3062	0.8	25	2.2	0.50	29.65	2.1	FALSE	0.5	29.7	2.1	1.5	33	48	0.090	4260	2675	0.89	0.24	0.91	1.19	0.41	Yes	Yes	Yes
	34.90	-6.5	39.0	0.10	0.27	4334	3067	0.8	24	2.2	0.50	28.92	2.1	FALSE	0.5	28.9	2.1	1.5	32	48	0.090	4272	2680	0.89	0.24	0.91	1.19	0.40	Yes	Yes	Yes
	35.10	-6.7	38.5	0.10	0.28	4358	3079	0.8	24	2.2	0.50	28.46	2.1	FALSE	0.5	28.5	2.1	1.5	32	48	0.090	4296	2692	0.89	0.24	0.91	1.19	0.40	Yes	Yes	Yes
	35.30	-6.9	38.0	0.10	0.28	4382	3090	0.8	23	2.2	0.50	28.01	2.1	FALSE	0.5	28.0	2.1	1.5	31	48	0.090	4320	2703	0.89	0.24	0.91	1.19	0.40	Yes	Yes	Yes
	35.40	-7.0	37.6	0.10	0.28	4394	3096	0.8	23	2.2	0.50	27.66	2.1	FALSE	0.5	27.7	2.1	1.5	31	47	0.089	4332	2709	0.89	0.24	0.91	1.19	0.40	Yes	Yes	Yes
	35.60	-7.2	37.6	0.10	0.28	4418	3108	0.8	23	2.2	0.50	27.60	2.1	FALSE	0.5	27.6	2.1	1.5	31	47	0.089	4356	2721	0.88	0.24	0.91	1.19	0.40	Yes	Yes	Yes
	35.80	-7.4	37.8	0.10	0.28	4442	3119	0.8	23	2.2	0.50	27.70	2.1	FALSE	0.5	27.7	2.1	1.5	31	47	0.089	4380	2732	0.88	0.24	0.91	1.19	0.40	Yes	Yes	Yes
	35.90	-7.5	37.5	0.10	0.28	4454	3125	0.8	23	2.2	0.50	27.43	2.1	FALSE	0.5	27.4	2.1	1.5	31	47	0.089	4392	2738	0.88	0.24	0.91	1.19	0.40	Yes	Yes	Yes
	36.10	-7.7	37.6	0.10	0.28	4478	3136	0.8	23	2.2	0.50	27.45	2.1	FALSE	0.5	27.5	2.1	1.5	31	47	0.089	4416	2750	0.88	0.24	0.91	1.19	0.40	Yes	Yes	Yes
	36.30	-7.9	39.3	0.10	0.27	4502	3148	0.8	24	2.2	0.50	28.71	2.1	FALSE	0.5	28.7	2.1	1.5	32	48	0.090	4440	2761	0.88	0.24	0.91	1.19	0.40	Yes	Yes	Yes
	36.40	-8.0	41.3	0.10	0.26	4514	3154	0.8	25	2.2	0.50	30.23	2.1	FALSE	0.5	30.2	2.1	1.4	34	48	0.090	4452	2767	0.88	0.24	0.91	1.19	0.41	Yes	Yes	Yes
	36.60	-8.2	41.9	0.20	0.50	4538	3165	0.8	25	2.3	0.50	30.63	2.2	FALSE	0.5	30.6	2.2	1.6	34	56	0.096	4476	2778	0.88	0.24	0.90	1.19	0.43	Yes	Yes	Yes
	36.70	-8.3	42.6	0.20	0.50	4550	3171	0.8	25	2.3	0.50	31.14	2.2	FALSE	0.5	31.1	2.2	1.6	35	56	0.097	4488	2784	0.88	0.24	0.90	1.19	0.43	Yes	Yes	Yes
	36.90	-8.5	42.7	0.20	0.49	4574	3182	0.8	25	2.3	0.50	31.15	2.2	FALSE	0.5	31.1	2.2	1.6	35	56	0.097	4512	2796	0.87	0.24	0.90	1.19	0.43	Yes	Yes	Yes
	37.10	-8.7	42.8	0.20	0.49	4598	3194	0.8	25	2.3	0.50	31.16	2.2	FALSE	0.5	31.2	2.2	1.6	35	56	0.097	4536	2807	0.87	0.24	0.90	1.19	0.43	Yes	Yes	Yes
	37.20	-8.8	45.7	0.20	0.46	4610	3200	0.8	27	2.2	0.50	33.35	2.1	FALSE	0.5	33.4	2.1	1.5	37	57	0.097	4548	2813	0.87	0.24	0.90	1.19	0.44	Yes	Yes	Yes
	37.40	-9.0	50.3	0.20	0.42	4634	3211	0.8	30	2.2	0.50	36.81	2.1	FALSE	0.5	36.8	2.1	1.4	41	58	0.098	4572	2824	0.87	0.24	0.90	1.19	0.44	Yes	Yes	Yes
	37.60	-9.2	54.0	0.20	0.39	4658	3223	0.8	32	2.1	0.50	39.57	2.0	FALSE	0.5	39.6	2.0	1.4	44	59	0.099	4596	2836	0.87	0.24	0.90	1.19	0.45	Yes	Yes	Yes
	37.70	-9.3	54.4	0.20	0.38	4670	3229	0.8	32	2.1	0.50	39.84	2.0	FALSE	0.5	39.8	2.0	1.3	44	59	0.100	4608	2842	0.87	0.24	0.90	1.19	0.45	Yes	Yes	Yes
	37.90	-9.5	54.2	0.20	0.39	4694	3240	0.8	32	2.1	0.50	39.61	2.0	FALSE	0.5	39.6	2.0	1.4	44	59	0.099	4632	2853	0.87	0.24	0.90	1.19	0.45	Yes	Yes	Yes
	38.10	-9.7	53.3	0.20	0.39	4718	3252	0.8	31	2.1	0.50	38.84	2.0	FALSE	0.5	38.8	2.0	1.4	43	59	0.099	4656	2865	0.86	0.24	0.90	1.19	0.44	Yes	Yes	Yes
	38.20	-9.8	52.3	0.20	0.40	4730	3257	0.8	31	2.1	0.50	38.04	2.1	FALSE	0.5	38.0	2.1	1.4	42	59	0.099	4668	2870	0.86	0.24	0.90	1.19	0.44	Yes	Yes	Yes
	38.40	-10.0	51.9	0.20	0.40	4754	3269	0.8	30	2.2	0.50	37.66	2.1	FALSE	0.5	37.7	2.1	1.4	42	58	0.098	4692	2882	0.86	0.24	0.90	1.19	0.44	Yes	Yes	Yes
	38.60	-10.2	53.3	0.20	0.39	4778	3280	0.8	31	2.1	0.50	38.65	2.1	FALSE	0.5	38.6	2.1	1.4	43	59	0.099	4716	2894	0.86	0.24	0.90	1.19	0.44	Yes	Yes	Yes
	38.70	-10.3	53.0	0.20	0.40	4790	3286	0.8	31	2.1	0.50	38.38	2.1	FALSE	0.5	38.4	2.1	1.4	43	59	0.099	4728	2899	0.86	0.24	0.90	1.19	0.44	Yes	Yes	Yes
	38.90	-10.5	53.5	0.20	0.39	4814	3298	0.8	31	2.1	0.50	38.68	2.1	FALSE	0.5	38.7	2.1	1.4	43	59	0.099	4752	2911	0.86	0.24	0.90	1.19	0.44	Yes	Yes	Yes
	39.00	-10.6	53.9	0.10	0.19	4826	3303	0.8	31	2.0	0.50	38.95	1.9	FALSE	0.5	38.9	1.9	1.2	43	53	0.094	4764	2917	0.86	0.24	0.89	1.19	0.42	Yes	Yes	Yes
	39.20	-10.8	50.5	0.20	0.42	4850	3315	0.8	29	2.2	0.50	36.30	2.1	FALSE	0.5	36.3	2.1	1.4	40	58	0.098	4788	2928	0.85	0.24	0.89	1.19	0.44	Yes	Yes	Yes
	39.40	-11.0	45.4	0.20	0.47	4874	3326	0.8	26	2.2	0.50	32.39	2.2	FALSE	0.5	32.4	2.2	1.6	36	56	0.097	4812	2940	0.85	0.24	0.89	1.19	0.43	Yes	Yes	Yes
	39.50	-11.1	45.3	0.30	0.70	4886	3332	0.8	26	2.3	0.50	32.28	2.2	FALSE	0.5	32.3	2.2	1.7	36	63	0.103	4824	2945	0.85	0.24	0.89	1.19	0.46	Yes	Yes	Yes
	39.70	-11.3	51.4	0.30	0.61	4910	3344	0.8	29	2.2	0.50	36.80	2.2	FALSE	0.5	36.8	2.2	1.6	41	64	0.104	4848	2957	0.85	0.24	0.89	1.19	0.47	Yes	Yes	Yes
	39.90	-11.5	52.7	0.30	0.60	4934	3355	0.8	30	2.2	0.50	37.70	2.1	FALSE	0.5	37.7	2.1	1.5	42	64	0.104	4872	2968	0.85	0.24	0.89	1.19	0.47	Yes	Yes	Yes
	40.00	-11.6	49.9	0.20	0.42	4946	3361	0.8	28	2.2	0.50	35.57	2.1	FALSE	0.5	35.6	2.1	1.4	40	57	0.098	4884	2974	0.85	0.24	0.89	1.19	0.44	Yes	Yes	Yes
	40.20	-11.8	48.4	0.20	0.44	4970	3373	0.8	27	2.2	0.50	34.38	2.1	FALSE	0.5	34.4	2.1	1.5	38	57	0.097	4908	2986	0.85	0.24	0.89	1.19	0.43	Yes	Yes	Yes
	40.40	-12.0	53.3	0.20	0.39	4994	3384	0.8	30	2.2	0.50	37.97	2.1	FALSE	0.5	38.0	2.1	1.4	42	58	0.098	4932	2997	0.85	0.24	0.89	1.19	0.44	Yes	Yes	Yes
	40.50	-12.1	62.3	0.20	0.33	5006	3390	0.8	35	2.1	0.50	44.65	2.0	FALSE	0.5	44.7	2.0	1.3	49	62	0.102	4944	3003	0.84	0.24	0.89	1.19	0.46	Yes	Yes	Yes
	40.70	-12.3	71.5	0.30	0.43	5030	3401	0.8	41	2.1	0.50	51.43	2.0	FALSE	0.5	51.4	2.0	1.2	56	70	0.112	4968	3014	0.84	0.24	0.89	1.19	0.50	Yes	Yes	Yes
	40.80	-12.4	75.1	0.30	0.41	5042	3407	0.8	43	2.0	0.50	54.06	1.9	FALSE	0.5	54.1	1.9	1.2	59	72	0.115	4980	3020	0.84	0.24	0.89	1.19	0.51	Yes	Yes	Yes
	41.00	-12.6	76.9	0.30	0.40	5066	3419	0.8	44	2.0	0.50	55.30	1.9	FALSE	0.5	55.3	1.9	1.2	61	73	0.116	5004	3032	0.84	0.24	0.89	1.19	0.52	Yes	Yes	Yes
	41.20	-12.8	78.4	0.40	0.53	5090	3430	0.8	44	2.1	0.50	56.31	2.0	FALSE	0.5	56.3	2.0	1.3	62	77	0.123	5028	3043	0.84	0.24	0.89	1.19	0.55	Yes	Yes	Yes
	41.30	-12.9	80.3	0.40	0.51	5102	3436	0.8	45	2.0	0.50	57.67	1.9	FALSE	0.5	57.7	1.9	1.2	63	78	0.124	5040	3049	0.84	0.24	0.89	1.19	0.56	Yes	Yes	Yes
	41.50	-13.1	83.5	0.40	0.49	5126	3447	0.8	47	2.0	0.50	59.93	1.9	FALSE	0.5	59.9	1.9	1.2	65	79	0.126	5064	3061	0.84	0.24	0.89	1.19	0.57	Yes	Yes	Yes
	41.70	-13.3	85.3	0.40	0.48	5150	3459	0.8	48	2.0	0.50	61.16	1.9	FALSE	0.5	61.2	1.9	1.2	67	80	0.128	5088	3072	0.83	0.24	0.88	1.19	0.57	Yes	Yes	Yes
	41.80	-13.4	90.2	0.40	0.46	5162	3465	0.8	51	2.0	0.50	64.72	1.9	FALSE	0.5	64.7	1.9	1.2	70	82	0.132	5100	3078	0.83	0.24	0.88	1.19	0.59	Yes	Yes	Yes
	42.00	-13.6	93.6	0.40	0.44	5186	3476	0.8	52	2.0	0.50	67.11	1.9	FALSE	0.5	67.1	1.9	1.2	73	84	0.135	5124	3089	0.83	0.24	0.88	1.19	0.61	Yes	Yes	Yes
	42.20	-13.8	97.4	0.40	0.42	5210	3488	0.8	54	1.9	0.50	69.79	1.8	FALSE	0.5	69.8	1.8	1.1	76	86	0.139	5148	3101	0.83	0.23	0.88	1.19	0.62	Yes	Yes	Yes
	42.30	-13.9	95.9	0.30	0.32	5222	3494	0.8	53	1.9	0.50	68.62	1.8	FALSE	0.5	68.6	1.8	1.1	75	82	0.131	5160	3107	0.83	0.23	0.88	1.19	0.59	Yes	Yes	Yes
	42.50	-14.1	94.1	0.30	0.33	5246	3505	0.8	52	1.9	0.50	67.18	1.8	FALSE	0.5	67.2	1.8	1.1	73	81	0.129	5184	3118	0.83	0.23	0.88	1.19	0.58	Yes	Yes	Yes
	42.70	-14.3	89.9	0.40	0.46	5270	3517	0.8	50	2.0	0.50	63.98	1.9	FALSE	0.5	64.0	1.9	1.2	70	82	0.131	5208	3130	0.83	0.23	0.88	1.19	0.59	Yes	Yes	Yes
	42.80	-14.4	90.0	0.40	0.46	5282	3522	0.8	50	2.0	0.50	64.00	1.9	FALSE	0.5	64.0	1.9	1.2	70	82	0.131	5220	3135	0.83	0.23	0.88	1.19	0.59	Yes	Yes	Yes
	43.00	-14.6	88.6	0.40	0.47	5306	3534	0.8	49	2.0	0.50	62.86	1.9	FALSE	0.5	62.9	1.9	1.2	69	81	0.130	5244	3147	0.82	0.23	0.88	1.19	0.58	Yes	Yes	Yes
	43.10	-14.7	83.4	0.40	0.50	5318	3540	0.8	46	2.0	0.50	59.01	1.9	FALSE	0.5	59.0	1.9	1.2	64	79	0.125	5256	3153	0.82	0.23	0.88	1.19	0.56	Yes	Yes	Yes
	43.30	-14.9	85.0	0.40	0.49	5342	3551	0.8	46	2.0	0.50	60.07	1.9	FALSE	0.5	60.1	1.9	1.2	66	79	0.126	5280	3164	0.82	0.23	0.88	1.19	0.57	Yes	Yes	Yes
	43.50	-15.1	85.8	0.40	0.48	5366	3563	0.8	47	2.0	0.50	60.54	1.9	FALSE	0.5	60.5	1.9	1.2	66	80	0.127	5304	3176	0.82	0.23	0.88	1.19	0.57	Yes	Yes	Yes
	43.60	-15.2	83.7	0.40	0.49	5378	3568	0.8	45	2.0	0.50	58.96	1.9	FALSE	0.5	59.0	1.9	1.2	64	78	0.125	5316	3182	0.82	0.23	0.88	1.19	0.56	Yes	Yes	Yes

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{va} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude: Kσ	MSF	Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
	43.80	-15.4	84.1	0.40	0.49	5402	3580	0.8	45	2.0	0.50	59.15	1.9	FALSE	0.5	59.1	1.9	1.2	65	79	0.125	5340	3193	0.82	0.23	0.88	1.19	0.56	Yes	Yes	Yes
	44.00	-15.6	79.5	0.40	0.52	5426	3591	0.8	43	2.1	0.50	55.71	2.0	FALSE	0.5	55.7	2.0	1.3	61	76	0.122	5364	3205	0.82	0.23	0.88	1.19	0.55	Yes	Yes	Yes
	44.10	-15.7	74.4	0.30	0.42	5438	3597	0.8	40	2.1	0.50	51.96	1.9	FALSE	0.5	52.0	1.9	1.2	57	70	0.113	5376	3210	0.82	0.23	0.88	1.19	0.51	Yes	Yes	Yes
	44.30	-15.9	67.8	0.30	0.46	5462	3609	0.8	36	2.1	0.50	47.09	2.0	FALSE	0.5	47.1	2.0	1.3	52	68	0.109	5400	3222	0.81	0.23	0.88	1.19	0.49	Yes	Yes	Yes
	44.50	-16.1	68.7	0.30	0.45	5486	3620	0.8	36	2.1	0.50	47.66	2.0	FALSE	0.5	47.7	2.0	1.3	53	68	0.109	5424	3233	0.81	0.23	0.87	1.19	0.49	Yes	Yes	Yes
	44.60	-16.2	76.2	0.30	0.41	5498	3626	0.8	41	2.0	0.50	53.03	1.9	FALSE	0.5	53.0	1.9	1.2	58	71	0.113	5436	3239	0.81	0.23	0.87	1.19	0.51	Yes	Yes	Yes
	44.80	-16.4	88.2	0.30	0.35	5522	3638	0.8	47	2.0	0.50	61.59	1.8	FALSE	0.5	61.6	1.8	1.1	67	77	0.122	5460	3251	0.81	0.23	0.87	1.19	0.55	Yes	Yes	Yes
	44.90	-16.5	93.4	0.30	0.33	5534	3643	0.8	50	1.9	0.50	65.28	1.8	FALSE	0.5	65.3	1.8	1.1	71	79	0.127	5472	3256	0.81	0.23	0.87	1.19	0.57	Yes	Yes	Yes
	45.10	-16.7	93.2	0.30	0.33	5558	3655	0.8	49	1.9	0.50	65.03	1.8	FALSE	0.5	65.0	1.8	1.1	71	79	0.126	5496	3268	0.81	0.23	0.87	1.19	0.57	Yes	Yes	Yes
	45.30	-16.9	97.7	0.30	0.32	5582	3666	0.8	52	1.9	0.50	68.15	1.8	FALSE	0.5	68.1	1.8	1.1	74	81	0.130	5520	3279	0.81	0.23	0.87	1.19	0.59	Yes	Yes	Yes
	45.40	-17.0	95.0	0.30	0.33	5594	3672	0.8	50	1.9	0.50	66.15	1.8	FALSE	0.5	66.2	1.8	1.1	72	80	0.128	5532	3285	0.80	0.23	0.87	1.19	0.58	Yes	Yes	Yes
	45.60	-17.2	89.7	0.20	0.23	5618	3684	0.8	47	1.9	0.50	62.25	1.8	FALSE	0.5	62.2	1.8	1.1	68	74	0.118	5556	3297	0.80	0.23	0.87	1.19	0.53	Yes	Yes	Yes
	45.80	-17.4	87.4	0.20	0.24	5642	3695	0.8	46	1.9	0.50	60.50	1.8	FALSE	0.5	60.5	1.8	1.1	66	73	0.116	5580	3308	0.80	0.23	0.87	1.19	0.52	Yes	Yes	Yes
	45.90	-17.5	86.5	0.20	0.24	5654	3701	0.8	45	1.9	0.50	59.80	1.8	FALSE	0.5	59.8	1.8	1.1	65	72	0.115	5592	3314	0.80	0.23	0.87	1.19	0.52	Yes	Yes	Yes
	46.10	-17.7	90.4	0.20	0.23	5678	3712	0.8	47	1.9	0.50	62.48	1.8	FALSE	0.5	62.5	1.8	1.1	68	74	0.118	5616	3326	0.80	0.23	0.87	1.19	0.53	Yes	Yes	Yes
	46.30	-17.9	84.4	0.30	0.37	5702	3724	0.8	44	2.0	0.50	58.10	1.9	FALSE	0.5	58.1	1.9	1.2	64	74	0.118	5640	3337	0.80	0.23	0.87	1.19	0.53	Yes	Yes	Yes
	46.40	-18.0	79.3	0.30	0.39	5714	3730	0.8	41	2.0	0.50	54.42	1.9	FALSE	0.5	54.4	1.9	1.2	60	72	0.115	5652	3343	0.80	0.23	0.87	1.19	0.52	Yes	Yes	Yes
	46.60	-18.2	69.8	0.30	0.45	5738	3741	0.8	36	2.1	0.50	47.58	2.0	FALSE	0.5	47.6	2.0	1.3	52	68	0.109	5676	3354	0.79	0.23	0.87	1.19	0.49	Yes	Yes	Yes
	46.80	-18.4	63.0	0.20	0.33	5762	3753	0.8	32	2.1	0.50	42.67	2.0	FALSE	0.5	42.7	2.0	1.3	47	61	0.101	5700	3366	0.79	0.23	0.87	1.19	0.45	Yes	Yes	Yes
	46.90	-18.5	66.3	0.30	0.47	5774	3758	0.8	34	2.1	0.50	44.97	2.0	FALSE	0.5	45.0	2.0	1.3	50	66	0.107	5712	3372	0.79	0.23	0.87	1.19	0.48	Yes	Yes	Yes
	47.10	-18.7	88.8	0.30	0.35	5798	3770	0.7	46	2.0	0.50	60.83	1.9	FALSE	0.5	60.8	1.9	1.1	67	76	0.121	5736	3383	0.79	0.23	0.87	1.19	0.55	Yes	Yes	Yes
	47.20	-18.8	89.2	0.40	0.46	5810	3776	0.7	46	2.0	0.50	61.06	1.9	FALSE	0.5	61.1	1.9	1.2	67	80	0.127	5748	3389	0.79	0.23	0.87	1.19	0.57	Yes	Yes	Yes
	47.40	-19.0	72.5	0.30	0.43	5834	3787	0.7	37	2.1	0.50	49.16	2.0	FALSE	0.5	49.2	2.0	1.3	54	69	0.110	5772	3400	0.79	0.23	0.86	1.19	0.50	Yes	Yes	Yes
	47.60	-19.2	66.9	0.30	0.47	5858	3799	0.7	34	2.1	0.50	45.13	2.0	FALSE	0.5	45.1	2.0	1.3	50	66	0.107	5796	3412	0.79	0.23	0.86	1.19	0.49	Yes	Yes	Yes
	47.70	-19.3	69.7	0.30	0.45	5870	3805	0.7	35	2.1	0.50	47.06	2.0	FALSE	0.5	47.1	2.0	1.3	52	67	0.109	5808	3418	0.79	0.23	0.86	1.19	0.49	Yes	Yes	Yes
	47.90	-19.5	78.8	0.30	0.40	5894	3816	0.7	40	2.0	0.50	53.39	1.9	FALSE	0.5	53.4	1.9	1.2	59	71	0.114	5832	3429	0.78	0.23	0.86	1.19	0.51	Yes	Yes	Yes
	48.10	-19.7	78.1	0.30	0.40	5918	3828	0.7	39	2.0	0.50	52.81	1.9	FALSE	0.5	52.8	1.9	1.2	58	71	0.113	5856	3441	0.78	0.23	0.86	1.19	0.51	Yes	Yes	Yes
	48.20	-19.8	75.8	0.30	0.41	5930	3833	0.7	38	2.1	0.50	51.15	1.9	FALSE	0.5	51.1	1.9	1.2	56	70	0.112	5868	3446	0.78	0.23	0.86	1.19	0.51	Yes	Yes	Yes
	48.40	-20.0	70.7	0.30	0.44	5954	3845	0.7	35	2.1	0.50	47.49	2.0	FALSE	0.5	47.5	2.0	1.3	52	68	0.109	5892	3458	0.78	0.23	0.86	1.19	0.49	Yes	Yes	Yes
	48.60	-20.2	63.7	0.30	0.49	5978	3856	0.7	31	2.2	0.50	42.51	2.1	FALSE	0.5	42.5	2.1	1.4	47	65	0.106	5916	3470	0.78	0.23	0.86	1.19	0.48	Yes	Yes	Yes
	48.70	-20.3	61.9	0.20	0.34	5990	3862	0.7	31	2.1	0.50	41.21	2.0	FALSE	0.5	41.2	2.0	1.3	46	60	0.100	5928	3475	0.78	0.23	0.86	1.19	0.45	Yes	Yes	Yes
	48.90	-20.5	66.2	0.20	0.32	6014	3874	0.7	33	2.1	0.50	44.14	2.0	FALSE	0.5	44.1	2.0	1.3	49	61	0.101	5952	3487	0.78	0.23	0.86	1.19	0.46	Yes	Yes	Yes
	49.00	-20.6	74.3	0.20	0.28	6026	3879	0.7	37	2.0	0.50	49.76	1.9	FALSE	0.5	49.8	1.9	1.2	55	65	0.106	5964	3493	0.78	0.23	0.86	1.19	0.48	Yes	Yes	Yes
	49.20	-20.8	69.3	0.20	0.30	6050	3891	0.7	34	2.1	0.50	46.19	1.9	FALSE	0.5	46.2	1.9	1.2	51	63	0.103	5988	3504	0.77	0.23	0.86	1.19	0.47	Yes	Yes	Yes
	49.40	-21.0	62.8	0.20	0.33	6074	3902	0.7	31	2.1	0.50	41.59	2.0	FALSE	0.5	41.6	2.0	1.3	46	60	0.100	6012	3516	0.77	0.22	0.86	1.19	0.45	Yes	Yes	Yes
	49.50	-21.1	59.6	0.30	0.53	6086	3908	0.7	29	2.2	0.50	39.33	2.1	FALSE	0.5	39.3	2.1	1.5	44	64	0.104	6024	3521	0.77	0.22	0.86	1.19	0.47	Yes	Yes	Yes
	49.70	-21.3	62.1	0.30	0.51	6110	3920	0.7	30	2.2	0.50	41.00	2.1	FALSE	0.5	41.0	2.1	1.4	46	64	0.105	6048	3533	0.77	0.22	0.86	1.19	0.48	Yes	Yes	Yes
	49.90	-21.5	70.0	0.50	0.75	6134	3931	0.7	34	2.2	0.50	46.41	2.1	FALSE	0.5	46.4	2.1	1.5	51	76	0.120	6072	3544	0.77	0.22	0.86	1.19	0.55	Yes	Yes	Yes
	50.00	-21.6	75.3	0.90	1.25	6146	3937	0.7	37	2.3	0.50	50.05	2.2	FALSE	0.5	50.0	2.2	1.7	55	93	0.154	6084	3550	0.77	0.22	0.86	1.19	0.70	Yes	Yes	Yes
	50.20	-21.8	72.4	0.60	0.87	6170	3949	0.7	35	2.2	0.50	47.96	2.1	FALSE	0.5	48.0	2.1	1.5	53	80	0.128	6108	3562	0.77	0.22	0.86	1.19	0.58	Yes	Yes	Yes
	50.40	-22.0	69.1	0.70	1.06	6194	3960	0.7	33	2.3	0.50	45.60	2.2	FALSE	0.5	45.6	2.2	1.7	51	84	0.135	6132	3573	0.76	0.22	0.85	1.19	0.62	Yes	Yes	Yes
	50.50	-22.1	69.7	0.70	1.05	6206	3966	0.7	34	2.3	0.50	45.98	2.2	FALSE	0.5	46.0	2.2	1.6	51	84	0.135	6144	3579	0.76	0.22	0.85	1.19	0.62	Yes	Yes	Yes
	50.70	-22.3	70.6	0.30	0.44	6230	3977	0.7	34	2.1	0.50	46.52	2.0	FALSE	0.5	46.5	2.0	1.3	51	67	0.108	6168	3590	0.76	0.22	0.85	1.19	0.49	Yes	Yes	Yes
	50.90	-22.5	65.8	0.20	0.32	6254	3989	0.7	31	2.1	0.50	43.14	2.0	FALSE	0.5	43.1	2.0	1.3	48	61	0.101	6192	3602	0.76	0.22	0.85	1.19	0.46	Yes	Yes	Yes
	51.00	-22.6	59.1	0.10	0.18	6266	3995	0.7	28	2.1	0.50	38.50	1.9	FALSE	0.5	38.5	1.9	1.2	43	53	0.094	6204	3608	0.76	0.22	0.85	1.19	0.43	Yes	Yes	Yes
	51.20	-22.8	51.8	0.10	0.21	6290	4006	0.7	24	2.2	0.50	33.42	2.0	FALSE	0.5	33.4	2.0	1.3	38	50	0.092	6228	3619	0.76	0.22	0.85	1.19	0.42	Yes	Yes	Yes
	51.30	-22.9	53.7	0.10	0.20	6302	4012	0.7	25	2.1	0.50	34.70	2.0	FALSE	0.5	34.7	2.0	1.3	39	51	0.092	6240	3625	0.76	0.22	0.85	1.19	0.42	Yes	Yes	Yes
	51.50	-23.1	63.0	0.10	0.17	6326	4023	0.7	30	2.0	0.50	41.02	1.9	FALSE	0.5	41.0	1.9	1.2	46	55	0.095	6264	3637	0.75	0.22	0.85	1.19	0.44	Yes	Yes	Yes
	51.70	-23.3	67.0	0.20	0.31	6350	4035	0.7	32	2.1	0.50	43.69	2.0	FALSE	0.5	43.7	2.0	1.3	49	61	0.101	6288	3648	0.75	0.22	0.85	1.19	0.46	Yes	Yes	Yes
	51.80	-23.4	60.2	0.20	0.35	6362	4041	0.7	28	2.2	0.50	39.00	2.0	FALSE	0.5	39.0	2.0	1.3	44	58	0.098	6300	3654	0.75	0.22	0.85	1.19	0.45	Yes	Yes	Yes
	52.00	-23.6	55.4	0.10	0.19	6386	4052	0.7	26	2.1	0.50	35.66	2.0	FALSE	0.5	35.7	2.0	1.3	40	51	0.092	6324	3665	0.75	0.22	0.85	1.19	0.42	Yes	Yes	Yes
	52.20	-23.8	54.4	0.10	0.20	6410	4064	0.7	25	2.1	0.50	34.92	2.0	FALSE	0.5	34.9	2.0	1.3	39	51	0.092	6348	3677	0.75	0.22	0.85	1.19	0.42	Yes	Yes	Yes
	52.30	-23.9	57.3	0.10	0.18	6422	4070	0.7	27	2.1	0.50	36.86	2.0	FALSE	0.5	36.9	2.0	1.3	41	52	0.093	6360	3683	0.75	0.22	0.85	1.19	0.43	Yes	Yes	Yes
	52.50	-24.1	65.3	0.10	0.16	6446	4081	0.7	30	2.0	0.50	42.25	1.9	FALSE	0.5	42.2	1.9	1.2	47	56	0.096	6384	3694	0.75	0.22	0.85	1.19	0.44	Yes	Yes	Yes
	52.70	-24.3	78.3	0.20	0.27	6470	4093	0.7	37	2.0	0.50	51.02	1.9	FALSE	0.5	51.0	1.9	1.2	56	66	0.106	6408	3706	0.75	0.22	0.85	1.19	0.49	Yes	Yes	Yes
	52.80	-24.4	95.8	0.40	0.43	6482	4098	0.7	45	2.0	0.50	62.86	1.9	FALSE	0.5	62.9	1.9	1.2	69	80	0.128	6420	3711	0.74	0.22	0.85	1.19	0.59	Yes	Yes	Yes
	53.00	-24.6	100.4	0.30	0.31	6506	4110	0.7	47	1.9	0.50	65.89	1.8	FALSE	0.5	65.9	1.8	1.1	72	80	0.127	6444	3723	0.74	0.22	0.85	1.19	0.59	Yes	Yes	Yes
	53.20	-24.8	87.1	0.30	0.36	6530	4121	0.7	41	2.0	0.50	56.78	1.9	FALSE	0.5	56.8	1.9	1.2	62	73	0.116	6468	3734	0.74	0.22	0.85	1.19	0.54	Yes	Yes	Yes
	53.30	-24.9	71.6	0.20	0.29	6542	4127	0.7	33	2.1	0.50	46.24	1.9	FALSE	0.5	46.2	1.9	1.2	51	63	0.103	6480	3740	0.74	0.22	0.85	1.19	0.47	Yes	Yes	Yes
	53.50	-25.1	61.6	0.30	0.51	6566	4139	0.7	28	2.2	0.50	39.41	2.1	FALSE	0.5	39.4	2.1	1.4	44	64	0.104	6504	3752	0.74	0.22	0.85	1.19	0.48	Yes	Yes	Yes
	53.60	-25.2	57.1	0.20	0.37	6578	4144	0.7	26	2.2	0.50	36.34	2.1	FALSE	0.5	36.3	2.1	1.4	41	57	0.097	6516	3758	0.74	0.22	0.85	1.19	0.45	Yes	Yes	Yes
	53.80	-25.4	54.7	0.20	0.39	6602	4156	0.7	25	2.2	0.50	34.67	2.1	FALSE	0.5	34.7	2.1	1.4	39	56	0.097	6540	3769	0.74	0.22	0.84	1.19	0.45	Yes	Yes	Yes
	54.00	-25.6	53.4	0.10	0.20	6626	4167	0.7	24	2.2	0.50	33.73	2.0	FALSE	0.5	33.7	2.0	1.3	38	50	0.092	6564	3781	0.73	0.22	0.84	1.19	0.42	Yes	Yes	Yes
	54.10	-25.7	56.0	0.10	0.19	6638	4173	0.7	25	2.1	0.50	35.46	2.0	FALSE	0.5	35.5	2.0	1.3	40	51	0.092	6576	3786	0.73	0.22	0.84	1.19	0.43	Yes	Yes	Yes
	54.30	-25.9	60.0	0.10	0.18	6662	4185	0.7	27	2.1	0.50	38.09	1.9	FALSE	0.5	38.1	1.9	1.2	43	53	0.094	6600	3798	0.73	0.22	0.84	1.19	0.43	Yes	Yes	Yes
	54.50	-26.1	66.5	0.10	0.16	6686	4196	0.7	30	2.0	0.50	42.39	1.9	FALSE	0.5	42.4	1.9	1.2	47	56	0.096	6624	3809	0.73	0.22	0.84	1.19	0.45	Yes	Yes	Yes
	54.60	-26.2	75.5	0.20	0.28	6698	4202	0.7	34	2.0	0.50	48.39	1.9	FALSE	0.5	48.4	1.9	1.2	54	64	0.104	6636	3815	0.73	0.22	0.84	1.19	0.48	Yes	Yes	Yes
	54.80	-26.4	93.2	0.30	0.33	6722	4214	0.7	43	2.0	0.50	60.17	1.8	FALSE	0.5	60.2	1.8	1.1	66	75	0.120	6660	3827	0.73	0.22	0.84	1.19	0.56	Yes	Yes	Yes
	55.00	-26.6	133.4	0.30	0.23	6746	4225	0.7	62	1.8	0.50	86.97	1.6	FALSE	0.5	87.0	1.6	1.0	94	94	0.158	6684	3838	0.73	0.22	0.84	1.19	0.74	Yes	Yes	Yes
	55.10	-26.7	184.6	0.30	0.17	6758	4231	0.7	86	1.6	0.50	121.13	1.5	FALSE	0.5	121.1	1.5	1.0	131	131	0.287	6696	3844	0.73	0.22	0.84	1.19	1.34	Yes	Yes	Yes
	55.30	-26.9	206.7	0.20	0.10	6782	4242	0.7	96	1.5	0.50	135.71	1.4	FALSE	0.5	135.7	1.4	1.0	146	146	0.369	6720	3855	0.72	0.21	0.84	1.19	1.72	Yes	Yes	No
	55.40	-27.0	205.0	0.20	0.10	6794	4248	0.7	95	1.5	0.50	134.48	1.4	FALSE	0.5	134.5	1.4	1.0	145	145	0.362	6732	3861	0.72	0.21	0.84	1.19	1.69	Yes	Yes	No
	55.60	-27.2	190.8	0.30	0.16	6818	4260	0.7	88	1.6	0.50	124.84	1.4	FALSE	0.5	124.8	1.4	1.0	134	134	0.306	6756	3873	0.72	0.21	0.84	1.19	1.43	Yes	Yes	No
	55.80	-27.4	187.8	0.40	0.22	6842	4271	0.7	86	1.6	0.50	122.66	1.5	FALSE	0.5	122.7	1.5	1.0	132	132	0.295	6780	3884	0.72	0.21	0.84	1.19	1.38	Yes	Yes	Yes
	55.90	-27.5	199.1	0.20	0.10	6854	4277	0.7	92	1.5	0.50	130.09	1.4	FALSE	0.5	130.1	1.4	1.0	140	140	0.335	6792	3890	0.72	0.21	0.84	1.19	1.57	Yes	Yes	No
	56.10	-27.7	192.0	0.50	0.27	6878	4288	0.7	88	1.7	0.50	125.19	1.5	FALSE	0.5	125.2	1.5	1.0	135	135	0.308	6816	3902	0.72	0.21	0.84	1.19	1.44	Yes	Yes	No
	56.30	-27.9	197.1	0.40	0.21	6902	4300	0.7	90	1.6	0.50	128.40	1.5	FALSE	0.5	128.4	1.5	1.0	138	138	0.326	6840	3913	0.72	0.21	0.84	1.19	1.53	Yes	Yes	No
	56.40	-28.0	178.8	0.30	0.17	6914	4306	0.7	81	1.6	0.50	116.18	1.5	FALSE	0.5	116.2	1.5	1.0	125	125	0.263	6852	3919	0.72	0.21	0.84	1.19	1.23	Yes	Yes	Yes
	56.60	-28.2	175.1	0.20	0.12	6938	4317	0.7	80	1.6	0.50	113.57	1.4	FALSE	0.5	113.6	1.4	1.0	123	123	0.251	6876	3930	0.71	0.21	0.84	1.19	1.18	Yes	Yes	Yes
	56.80	-28.4	171.6	0.30	0.18	6962	4329	0.7	78	1.6	0.50	111.10	1.5	FALSE	0.5	111.1	1.5	1.0	120	120	0.241	6900	3942	0.71	0.21	0.84	1.19	1.13	Yes	Yes	Yes
	56.90	-28.5	137.0	0.20	0.15	6974	4334	0.7	62	1.7	0.50	88.17	1.6	FALSE	0.5	88.2	1.6	1.0	96	96	0.162	6912	3948	0.71	0.21	0.84	1.19	0.76	Yes	Yes	Yes
	57.10	-28.7	106.4	0.20	0.19	6998	4346	0.7	47	1.9	0.50	67.87	1.7	FALSE	0.5	67.9	1.7	1.0	74	78	0.124	6936	3959	0.71	0.21	0.84	1.19	0.58	Yes	Yes	Yes
	57.30	-28.9	91.3	0.30	0.34	7022	4358	0.7	40	2.0	0.50	57.82	1.9	FALSE	0.5	57.8	1.9	1.2	64	74	0.117	6960	3971	0.71	0.21	0.83	1.19	0.55	Yes	Yes	Yes
	57.40	-29.0	82.7	0.40	0.51	7034	4363	0.7	36	2.1	0.50	52.12	2.0	FALSE	0.5	52.1	2.0	1.3	58	74	0.117	6972	3976	0.71	0.21	0.83	1.19	0.55	Yes	Yes	Yes
	57.60	-29.2	85.3	0.30	0.37	7058	4375	0.7	37	2.1	0.50	53.75	1.9	FALSE	0.5	53.8	1.9	1.2	59	71	0.113	6996	3988	0.71	0.21	0.83	1.19	0.53	Yes	Yes	Yes
	57.70	-29.3	82.0	0.30	0.38	7070	4381	0.7	36	2.1	0.50	51.54	1.9	FALSE	0.5	51.5	1.9	1.2	57	70	0.111	7008	3994	0.70	0.21	0.83	1.19	0.53	Yes	Yes	Yes
	57.90	-29.5	90.8	0.20	0.23	7094	4392	0.7	40	2.0	0.50	57.24	1.8	FALSE	0.5	57.2	1.8	1.1	63	70	0.112	7032	4005	0.70	0.21	0.83	1.19	0.53	Yes	Yes	Yes
	58.10	-29.7	106.6	0.20	0.19	7118	4404	0.7	47	1.9	0.50	67.51	1.7	FALSE	0.5	67.5	1.7	1.0	74	78	0.123	7056	4017	0.70	0.21	0.83	1.19	0.58	Yes	Yes	Yes
	58.20	-29.8	105.0	0.20	0.20	7130	4409	0.7	46	1.9	0.50	66.42	1.7	FALSE	0.5	66.4	1.7	1.1	73	77	0.122	7068	4022	0.70	0.21	0.83	1.19	0.58	Yes	Yes	Yes
	58.40	-30.0	90.9	0.20	0.23	7154	4421	0.7	40	2.0	0.50	57.10	1.8	FALSE	0.5	57.1	1.8	1.1	63	70	0.112	7092	4034	0.70	0.21	0.83	1.19	0.53	Yes	Yes	Yes
	58.60	-30.2	84.9	0.30	0.37	7178	4432	0.7	37	2.1	0.50	53.10	1.9	FALSE	0.5	53.1	1.9	1.2	59	71	0.113	7116	4046	0.70	0.21	0.83	1.19	0.53	Yes	Yes	Yes
	58.70	-30.3	81.0	0.20	0.26	7190	4438	0.7	35	2.0	0.50	50.52	1.9	FALSE	0.5	50.5	1.9	1.2	56	65	0.106	7128	4051	0.70	0.21	0.83	1.19	0.50	Yes	Yes	Yes

Boring No.	Depth [ft]	Elev. [ft]	qc (tsf)	fs (tsf)	Normalized Friction Ratio (%) $F_r = f_s/q_{t,net}$	Total vertical stress, σ_v [psf]	Drilling Effective vertical stress, σ'_{vd} [psf]	C_Q	Qt1	Ic (n=1)	n	Qtn	Ic	Ic(n=1)<2.6 and Ic>2.6?	n	Qtn	Ic	Kc	q_{c1N}	q_{c1NCS}	Cyclic Resistance Ratio, $CRR_{7.5}$	Design Total vertical stress, σ_{vb} [psf]	Design Effective vertical stress, σ'_{vb} [psf]	r_d	Cyclic Stress Ratio induced by design earthquake, CSR	Corrections for confining stress & EQ magnitude		Factor of Safety (FS) against liquefaction	Ic <= 2.6?	Below Analysis WSE?	Ic <= 2.6, FS < 1.4 and below AWSE?
																										Kσ	MSF				
	58.90	-30.5	74.8	0.20	0.28	7214	4450	0.7	32	2.1	0.50	46.40	1.9	FALSE	0.5	46.4	1.9	1.2	52	63	0.103	7152	4063	0.69	0.21	0.83	1.19	0.49	Yes	Yes	Yes
	59.10	-30.7	71.3	0.20	0.30	7238	4461	0.7	30	2.1	0.50	44.06	2.0	FALSE	0.5	44.1	2.0	1.2	49	61	0.101	7176	4074	0.69	0.21	0.83	1.19	0.48	Yes	Yes	Yes
	59.20	-30.8	72.1	0.10	0.15	7250	4467	0.7	31	2.0	0.50	44.54	1.9	FALSE	0.5	44.5	1.9	1.2	50	57	0.097	7188	4080	0.69	0.21	0.83	1.19	0.46	Yes	Yes	Yes
	59.40	-31.0	74.1	0.10	0.14	7274	4478	0.7	31	2.0	0.50	45.78	1.8	FALSE	0.5	45.8	1.8	1.1	51	58	0.098	7212	4092	0.69	0.21	0.83	1.19	0.47	Yes	Yes	Yes
	59.50	-31.1	77.2	0.10	0.14	7286	4484	0.7	33	2.0	0.50	47.76	1.8	FALSE	0.5	47.8	1.8	1.1	53	60	0.100	7224	4097	0.69	0.21	0.83	1.19	0.48	Yes	Yes	Yes
	59.70	-31.3	79.2	0.10	0.13	7310	4496	0.7	34	2.0	0.50	48.99	1.8	FALSE	0.5	49.0	1.8	1.1	54	61	0.101	7248	4109	0.69	0.21	0.83	1.19	0.48	Yes	Yes	Yes
	59.90	-31.5	81.9	0.10	0.13	7334	4507	0.7	35	2.0	0.50	50.66	1.8	FALSE	0.5	50.7	1.8	1.1	56	62	0.102	7272	4120	0.69	0.21	0.83	1.19	0.49	Yes	Yes	Yes
	60.00	-31.6	83.2	0.10	0.13	7346	4513	0.7	35	1.9	0.50	51.47	1.8	FALSE	0.5	51.5	1.8	1.1	57	63	0.103	7284	4126	0.69	0.21	0.83	1.19	0.49	Yes	Yes	Yes
	60.20	-31.8	86.9	0.10	0.12	7370	4525	0.7	37	1.9	0.50	53.79	1.8	FALSE	0.5	53.8	1.8	1.1	59	64	0.105	7308	4138	0.68	0.21	0.83	1.19	0.50	Yes	Yes	Yes
	60.40	-32.0	97.6	0.10	0.11	7394	4536	0.7	41	1.9	0.50	60.62	1.7	FALSE	0.5	60.6	1.7	1.0	67	69	0.111	7332	4149	0.68	0.21	0.83	1.19	0.53	Yes	Yes	Yes
	60.50	-32.1	113.6	0.10	0.09	7406	4542	0.7	48	1.8	0.50	70.90	1.6	FALSE	0.5	70.9	1.6	1.0	78	78	0.123	7344	4155	0.68	0.21	0.83	1.19	0.59	Yes	Yes	Yes
	60.70	-32.3	132.6	0.10	0.08	7430	4553	0.7	57	1.7	0.50	83.04	1.6	FALSE	0.5	83.0	1.6	1.0	90	90	0.149	7368	4166	0.68	0.20	0.83	1.19	0.72	Yes	Yes	Yes
	60.90	-32.5	140.7	0.10	0.07	7454	4565	0.7	60	1.7	0.50	88.14	1.5	FALSE	0.5	88.1	1.5	1.0	96	96	0.162	7392	4178	0.68	0.20	0.83	1.19	0.78	Yes	Yes	Yes
	61.00	-32.6	138.7	0.20	0.15	7466	4571	0.7	59	1.7	0.50	86.80	1.6	FALSE	0.5	86.8	1.6	1.0	94	94	0.158	7404	4184	0.68	0.20	0.82	1.19	0.76	Yes	Yes	Yes
	61.20	-32.8	129.6	0.20	0.16	7490	4582	0.7	55	1.8	0.50	80.84	1.6	FALSE	0.5	80.8	1.6	1.0	88	88	0.144	7428	4195	0.68	0.20	0.82	1.19	0.69	Yes	Yes	Yes
	61.40	-33.0	117.8	0.30	0.26	7514	4594	0.7	50	1.9	0.50	73.16	1.7	FALSE	0.5	73.2	1.7	1.1	80	85	0.136	7452	4207	0.67	0.20	0.82	1.19	0.66	Yes	Yes	Yes
	61.50	-33.1	105.5	0.30	0.29	7526	4599	0.7	44	2.0	0.50	65.22	1.8	FALSE	0.5	65.2	1.8	1.1	72	79	0.126	7464	4213	0.67	0.20	0.82	1.19	0.61	Yes	Yes	Yes
	61.70	-33.3	94.3	0.30	0.33	7550	4611	0.7	39	2.0	0.50	57.96	1.9	FALSE	0.5	58.0	1.9	1.2	64	74	0.117	7488	4224	0.67	0.20	0.82	1.19	0.57	Yes	Yes	Yes
	61.80	-33.4	89.4	0.30	0.35	7562	4617	0.7	37	2.0	0.50	54.79	1.9	FALSE	0.5	54.8	1.9	1.2	61	72	0.114	7500	4230	0.67	0.20	0.82	1.19	0.55	Yes	Yes	Yes
	62.00	-33.6	93.0	0.20	0.22	7586	4628	0.7	39	2.0	0.50	57.01	1.8	FALSE	0.5	57.0	1.8	1.1	63	70	0.112	7524	4241	0.67	0.20	0.82	1.19	0.54	Yes	Yes	Yes
	62.20	-33.8	104.1	0.30	0.30	7610	4640	0.7	43	2.0	0.50	64.02	1.8	FALSE	0.5	64.0	1.8	1.1	70	78	0.124	7548	4253	0.67	0.20	0.82	1.19	0.60	Yes	Yes	Yes
	62.30	-33.9	113.0	0.30	0.27	7622	4646	0.7	47	1.9	0.50	69.65	1.8	FALSE	0.5	69.7	1.8	1.1	76	82	0.131	7560	4259	0.67	0.20	0.82	1.19	0.64	Yes	Yes	Yes
	62.50	-34.1	125.5	0.40	0.33	7646	4657	0.7	52	1.9	0.50	77.52	1.7	FALSE	0.5	77.5	1.7	1.1	85	90	0.148	7584	4270	0.67	0.20	0.82	1.19	0.72	Yes	Yes	Yes
	62.70	-34.3	129.5	0.40	0.32	7670	4669	0.7	54	1.9	0.50	79.96	1.7	FALSE	0.5	80.0	1.7	1.1	87	92	0.152	7608	4282	0.66	0.20	0.82	1.19	0.74	Yes	Yes	Yes
	62.80	-34.4	126.8	0.40	0.33	7682	4674	0.7	53	1.9	0.50	78.19	1.7	FALSE	0.5	78.2	1.7	1.1	85	91	0.150	7620	4287	0.66	0.20	0.82	1.19	0.73	Yes	Yes	Yes
	63.00	-34.6	119.8	0.50	0.43	7706	4686	0.7	49	2.0	0.50	73.64	1.8	FALSE	0.5	73.6	1.8	1.1	81	90	0.148	7644	4299	0.66	0.20	0.82	1.19	0.72	Yes	Yes	Yes
	63.20	-34.8	115.9	0.50	0.45	7730	4697	0.7	48	2.0	0.50	71.07	1.8	FALSE	0.5	71.1	1.8	1.1	78	88	0.144	7668	4310	0.66	0.20	0.82	1.19	0.70	Yes	Yes	Yes
	63.30	-34.9	112.9	0.50	0.46	7742	4703	0.7	46	2.0	0.50	69.12	1.9	FALSE	0.5	69.1	1.9	1.1	76	87	0.141	7680	4316	0.66	0.20	0.82	1.19	0.69	Yes	Yes	Yes
	63.50	-35.1	106.5	0.40	0.39	7766	4715	0.7	44	2.0	0.50	64.98	1.8	FALSE	0.5	65.0	1.8	1.1	71	81	0.130	7704	4328	0.66	0.20	0.82	1.19	0.64	Yes	Yes	Yes
	63.60	-35.2	108.1	0.40	0.38	7778	4720	0.7	44	2.0	0.50	65.95	1.8	FALSE	0.5	65.9	1.8	1.1	72	82	0.131	7716	4334	0.66	0.20	0.82	1.19	0.64	Yes	Yes	Yes
	63.80	-35.4	121.0	0.40	0.34	7802	4732	0.7	49	1.9	0.50	74.01	1.8	FALSE	0.5	74.0	1.8	1.1	81	88	0.143	7740	4345	0.65	0.20	0.82	1.19	0.70	Yes	Yes	Yes
	64.00	-35.6	121.8	0.40	0.34	7826	4743	0.7	50	1.9	0.50	74.42	1.8	FALSE	0.5	74.4	1.8	1.1	81	88	0.143	7764	4357	0.65	0.20	0.82	1.19	0.71	Yes	Yes	Yes
	64.10	-35.7	124.9	0.40	0.33	7838	4749	0.7	51	1.9	0.50	76.33	1.8	FALSE	0.5	76.3	1.8	1.1	83	89	0.146	7776	4362	0.65	0.20	0.82	1.19	0.72	Yes	Yes	Yes
	64.30	-35.9	126.4	1.30	1.06	7862	4761	0.7	51	2.2	0.50	77.17	2.0	FALSE	0.5	77.2	2.0	1.3	84	111	0.208	7800	4374	0.65	0.20	0.82	1.19	1.02	Yes	Yes	Yes
	64.50	-36.1	135.8	1.70	1.29	7886	4772	0.7	55	2.2	0.50	82.99	2.0	FALSE	0.5	83.0	2.0	1.4	90	123	0.253	7824	4385	0.65	0.20	0.82	1.19	1.25	Yes	Yes	Yes
	64.60	-36.2	162.4	2.30	1.45	7898	4778	0.7	66	2.2	0.50	99.67	2.0	FALSE	0.5	99.7	2.0	1.3	108	143	0.353	7836	4391	0.65	0.20	0.82	1.19	1.74	Yes	Yes	No
	64.80	-36.4	200.3	2.20	1.12	7922	4790	0.7	82	2.0	0.50	123.35	1.9	FALSE	0.5	123.3	1.9	1.2	133	155	0.427	7860	4403	0.65	0.20	0.82	1.19	2.11	Yes	Yes	No
	65.00	-36.6	149.7	2.20	1.51	7946	4801	0.7	61	2.2	0.50	91.44	2.1	FALSE	0.5	91.4	2.1	1.4	99	137	0.321	7884	4414	0.65	0.20	0.81	1.19	1.59	Yes	Yes	No
	65.10	-36.7	139.8	2.30	1.69	7958	4807	0.7	57	2.2	0.50	85.17	2.1	FALSE	0.5	85.2	2.1	1.5	93	137	0.321	7896	4420	0.64	0.20	0.81	1.19	1.59	Yes	Yes	No
	65.30	-36.9	122.4	0.60	0.51	7982	4818	0.7	49	2.0	0.50	74.17	1.8	FALSE	0.5	74.2	1.8	1.1	81	93	0.154	7920	4431	0.64	0.20	0.81	1.19	0.77	Yes	Yes	Yes
	65.50	-37.1	105.8	0.50	0.49	8006	4830	0.7	42	2.1	0.50	63.69	1.9	FALSE	0.5	63.7	1.9	1.2	70	83	0.134	7944	4443	0.64	0.20	0.81	1.19	0.66	Yes	Yes	Yes
	65.60	-37.2	95.7	0.40	0.44	8018	4836	0.7	38	2.1	0.50	57.33	1.9	FALSE	0.5	57.3	1.9	1.2	63	76	0.121	7956	4449	0.64	0.19	0.81	1.19	0.60	Yes	Yes	Yes
	65.80	-37.4	89.5	0.40	0.47	8042	4847	0.7	35	2.1	0.50	53.38	2.0	FALSE	0.5	53.4	2.0	1.2	59	74	0.117	7980	4460	0.64	0.19	0.81	1.19	0.58	Yes	Yes	Yes
	65.90	-37.5	85.8	0.40	0.49	8054	4853	0.7	34	2.1	0.50	51.04	2.0	FALSE	0.5	51.0	2.0	1.3	57	72	0.115	7992	4466	0.64	0.19	0.81	1.19	0.58	Yes	Yes	Yes
	66.10	-37.7	88.9	0.50	0.59	8078	4864	0.7	35	2.2	0.50	52.90	2.0	FALSE	0.5	52.9	2.0	1.3	59	77	0.122	8016	4478	0.64	0.19	0.81	1.19	0.61	Yes	Yes	Yes
	66.30	-37.9	94.1	0.80	0.89	8102	4876	0.7	37	2.2	0.50	56.07	2.1	FALSE	0.5	56.1	2.1	1.4	62	88	0.143	8040	4489	0.63	0.19	0.81	1.19	0.72	Yes	Yes	Yes
	66.40	-38.0	107.1	0.70	0.68	8114	4882	0.7	42	2.1	0.50	64.12	2.0	FALSE	0.5	64.1	2.0	1.3	71	89	0.145	8052	4495	0.63	0.19	0.81	1.19	0.73	Yes	Yes	Yes
	66.60	-38.2	112.5	0.60	0.55	8138	4893	0.7	44	2.1	0.50	67.40	1.9	FALSE	0.5	67.4	1.9	1.2	74	88	0.144	8076	4506	0.63	0.19	0.81	1.19	0.72	Yes	Yes	Yes
	66.80	-38.4	121.3	0.60	0.51	8162	4905	0.7	48	2.0	0.50	72.77	1.9	FALSE	0.5	72.8	1.9	1.2	80	92	0.152	8100	4518	0.63	0.19	0.81	1.19	0.76	Yes	Yes	Yes
	66.90	-38.5	128.4	0.50	0.40	8174	4910	0.7	51	1.9	0.50	77.13	1.8	FALSE	0.5	77.1	1.8	1.1	84	92	0.153	8112	4524	0.63	0.19	0.81	1.19	0.77	Yes	Yes	Yes
	67.10	-38.7	129.4	0.50	0.40	8198	4922	0.7	51	1.9	0.50	77.65	1.8	FALSE	0.5	77.7	1.8	1.1	85	93	0.154	8136	4535	0.63	0.19	0.81	1.19	0.78	Yes	Yes	Yes
	67.30	-38.9	126.3	0.50	0.41	8222	4934	0.7	50	2.0	0.50	75.64	1.8	FALSE	0.5	75.6	1.8	1.1	83	91	0.151	8160	4547	0.63	0.19	0.81	1.19	0.76	Yes	Yes	Yes
	67.40	-39.0	122.9	0.50	0.42	8234	4939	0.7	48	2.0	0.50	73.48	1.8	FALSE	0.5	73.5	1.8	1.1	80	90	0.147	8172	4552	0.63	0.19	0.81	1.19	0.74	Yes	Yes	Yes
	67.60	-39.2	123.5	0.50	0.42	8258	4951	0.7	48	2.0	0.50	73.76	1.8	FALSE	0.5	73.8	1.8	1.1	81	90	0.148	8196	4564	0.62	0.19	0.81	1.19	0.75	Yes	Yes	Yes
	67.70	-39.3	128.7	0.50	0.40	8270	4957	0.7	50	2.0	0.50	76.93	1.8	FALSE	0.5	76.9	1.8	1.1	84	92	0.153	8208	4570	0.62	0.19	0.81	1.19	0.77	Yes	Yes	Yes
	67.90	-39.5	144.0	1.10	0.79	8294	4968	0.7	56	2.0	0.50	86.27	1.9	FALSE	0.5	86.3	1.9	1.2	94	111	0.209	8232	4581	0.62	0.19	0.81	1.19	1.06	Yes	Yes	Yes
	68.10	-39.7	180.4	1.20	0.68	8318	4980	0.7	71	1.9	0.50	108.59	1.8	FALSE	0.5	108.6	1.8	1.1	118	128	0.277	8256	4593	0.62	0.19	0.81	1.19	1.41	Yes	Yes	No
	68.20	-39.8	222.2	1.30	0.60	8330	4985	0.7	87	1.8	0.50	134.26	1.7	FALSE	0.5	134.3	1.7	1.0	145	147	0.378	8268	4598	0.62	0.19	0.81	1.19	1.92	Yes	Yes	No
	68.40	-40.0	214.4	0.80	0.38	8354	4997	0.7	84	1.7	0.50	129.30	1.6	FALSE	0.5	129.3	1.6	1.0	140	140	0.333	8292	4610	0.62	0.19	0.81	1.19	1.69	Yes	Yes	No
	68.60	-40.2	176.5	0.80	0.46	8378	5008	0.6	69	1.9	0.50	105.86	1.7	FALSE	0.5	105.9	1.7	1.0	115	119	0.236	8316	4622	0.62	0.19	0.81	1.19	1.20	Yes	Yes	Yes
	68.70	-40.3	164.5	0.80	0.50	8390	5014	0.6	64	1.9	0.50	98.43	1.7	FALSE	0.5	98.4	1.7	1.1	107	114	0.217	8328	4627	0.61	0.19	0.81	1.19	1.11	Yes	Yes	Yes
	68.90	-40.5	147.9	0.30	0.21	8414	5026	0.6	57	1.8	0.50	88.13	1.6	FALSE	0.5	88.1	1.6	1.0	96	96	0.162	8352	4639	0.61	0.19	0.81	1.19	0.83	Yes	Yes	Yes
	69.10	-40.7	133.3	0.30	0.23	8438	5037	0.6	51	1.9	0.50	79.08	1.7	FALSE	0.5	79.1	1.7	1.0	86	88	0.144	8376	4650	0.61	0.19	0.81	1.19	0.74	Yes	Yes	Yes
	69.20	-40.8	134.1	0.40	0.31	8450	5043	0.6	52	1.9	0.50	79.52	1.7	FALSE	0.5	79.5	1.7	1.1	87	91	0.151	8388	4656	0.61	0.19	0.80	1.19	0.77	Yes	Yes	Yes
	69.40	-41.0	136.2	0.20	0.15	8474	5054	0.6	52	1.8	0.50	80.70	1.6	FALSE	0.5	80.7	1.6	1.0	88	88	0.144	8412	4668	0.61	0.19	0.80	1.19	0.74	Yes	Yes	Yes
	69.60	-41.2	146.8	0.50	0.35	8498	5066	0.6	56	1.9	0.50	87.08	1.7	FALSE	0.5	87.1	1.7	1.0	95	99	0.171	8436	4679	0.61	0.19	0.80	1.19	0.88	Yes	Yes	Yes
	69.70	-41.3	171.6	2.00	1.20	8510	5072	0.6	66	2.1	0.50	102.17	2.0	FALSE	0.5	102.2	2.0	1.2	111	138	0.324	8448	4685	0.61	0.19	0.80	1.19	1.67	Yes	Yes	No
	69.90	-41.5	229.4	3.00	1.33	8534	5083	0.6	89	2.0	0.50	137.29	1.9	FALSE	0.5	137.3	1.9	1.2	148	175	0.600	8472	4696	0.61	0.19	0.80	1.19	3.09	Yes	Yes	No
	70.00	-41.6	288.9	2.50	0.88	8546	5089	0.6	112	1.8	0.50	173.47	1.7	FALSE	0.5	173.5	1.7	1.0	186	193	0.600	8484	4702	0.60	0.19	0.80	1.19	3.09	Yes	Yes	No
	70.20	-41.8	324.2	1.40	0.44	8570	5101	0.6	125	1.6	0.50	194.76	1.5	FALSE	0.5	194.8	1.5	1.0	209	209	0.600	8508	4714	0.60	0.19	0.80	1.19	3.10	Yes	Yes	No
	70.40	-42.0	285.6	1.10	0.39	8594	5112	0.6	110	1.6	0.50	171.06	1.5	FALSE	0.5	171.1	1.5	1.0	184	184	0.600	8532	4725	0.60	0.18	0.80	1.19	3.11	Yes	Yes	No
	70.50	-42.1	274.0	1.10	0.41	8606	5118	0.6	105	1.7	0.50	163.91	1.5	FALSE	0.5	163.9	1.5	1.0	176	176	0.600	8544	4731	0.60	0.18	0.80	1.19	3.11	Yes	Yes	No
	70.70	-42.3	250.1	0.60	0.24	8630	5129	0.6	96	1.6	0.50	149.21	1.4	FALSE	0.5	149.2	1.4	1.0	161	161	0.600	8568	4742	0.60	0.18	0.80	1.19	3.11	Yes	Yes	No
	70.90	-42.5	215.5	0.50	0.24	8654	5141	0.6	82	1.7	0.50	128.05	1.5	FALSE	0.5	128.1	1.5	1.0	138	138	0.326	8592	4754	0.60	0.18	0.80	1.19	1.69	Yes	Yes	No
	71.00	-42.6	225.3	0.50	0.23	8666	5147	0.6	86	1.6	0.50	133.92	1.5	FALSE	0.5	133.9	1.5	1.0	144	144	0.360	8604	4760	0.60	0.18	0.80	1.19	1.88	Yes	Yes	No
	71.20	-42.8	215.9	0.40	0.19	8690	5158	0.6	82	1.6	0.50	128.07	1.5	FALSE	0.5	128.1	1.5	1.0	138	138	0.326	8628	4771	0.59	0.18	0.80	1.19	1.70	Yes	Yes	No
	71.40	-43.0	214.4	0.40	0.19	8714	5170	0.6	81	1.6	0.50	127.01	1.5	FALSE	0.5	127.0	1.5	1.0	137	137	0.320	8652	4783	0.59	0.18	0.80	1.19	1.67	Yes	Yes	No
	71.50	-43.1	214.8	0.70	0.33	8726	5175	0.6	81	1.7	0.50	127.18	1.6	FALSE	0.5	127.2	1.6	1.0	137	137	0.321	8664	4789	0.59	0.18	0.80	1.19	1.68	Yes	Yes	No
	71.70	-43.3	231.0	3.50	1.54	8750	5187	0.6	87	2.1	0.50	136.81	1.9	FALSE	0.5	136.8	1.9	1.2	148	181	0.600	8688	4800	0.59	0.18	0.80	1.19	3.14	Yes	Yes	No
	71.90	-43.5	278.7	3.50	1.28	8774	5198	0.6	106	2.0	0.50	165.42	1.8	FALSE	0.5	165.4	1.8	1.1	178	200	0.600	8712	4812	0.59	0.18	0.80	1.19	3.15	Yes	Yes	No
	72.00	-43.6	239.7	3.50	1.49	8786	5204	0.6	90	2.1	0.50	141.82	1.9	FALSE	0.5	141.8	1.9	1.2	153	184	0.600	8724	4817	0.59	0.18	0.80	1.19	3.15	Yes	Yes	No

I Street Bridge Liquefaction Evaluation
Geotechnical Evaluation
Liquefaction Triggering Evaluation

Purpose: Evaluate susceptibility of sand-like soils to liquefaction.

Boring: **WM0004_031B** **West Embankment**

Method:
1) If no Atterberg limits are available for soil samples, the soil will be assumed to behave as sand-like. Note that silty clays with no Atterberg limits are included as sand-like.
2) For all soils assumed to behave as sand-like, compute $(N_1)_{60}$.
3) For potentially contractive sand-like soils [$(N_1)_{,60} < 30$], compute the factor of safety against pore pressure increase (Youd et al 2001).
4) If potentially contractive sand-like soils have a factor of safety ≤ 1.4, assume the soil is susceptible to liquefaction.

References:
1) Youd, T. L. et al. (2001). "Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils". J. Geotech. And Geoenv. Engrg., ASCE, 127(4):297-313.

Assumed:

Ground Surface Elevation at Time of Drilling (ft)	26.6	Ground surface elevation taken from boring log
Ground Surface Elevation at Time for Design (ft)	26.6	Assume same ground surface for evaluation
Unit Wt. of soil 1 (pcf)	120	Assumed unit weight above the groundwater table
Unit Wt. of soil 2 (pcf)	130	Assumed unit weight below the groundwater table
Earthquake Magnitude (M_w)	7.0	Magnitude is assumed based off previous WSAFCA Study
Earthquake PGA (g)	0.262	Assumed based off previous WSAFCA Study
Elevation of Groundwater at Time of Drilling (ft)	7.9	Value reported in log of Boring 123 in FSAR Appendix I
Elevation of Groundwater at Time for Design (ft)	20.0	Assumed to be at ground surface for design
Depth to Groundwater at Time of Drilling (ft)	18.7	Calculated from Groundwater Table Elevation at Drilling (above cell)
Depth to Groundwater for Design (ft)	6.6	Calculated from Groundwater Table Elevation at Design (above cell)
Length of Drilling Rod above the Ground Surface (ft)	5.0	Assumed

Corrections for hammer energy, borehole diameter, rod length, and sampling method (Ref. 1, Table 2):

Factor	Term	Equipment Variable	Correction
Energy Ratio	C_E	Energy ratio = 83.9%	1.4
Borehole Diameter	C_B	Diameter < 115 mm (assumed)	1.05
Sampling Method	C_S	Sampler without Liner (assumed)	1.0
Rod Length	C_R	0 ≤ d ≤ 3 m	0.75
		3 < d ≤ 4 m	0.80
		4 < d ≤ 6 m	0.85
		6 < d ≤ 10 m	0.95
		d > 10 m	1.00

Youd et al 2001 Eqn. No.	Equation
8, 10	$(N_1)_{60} = Nm * C_N * C_E * C_B * C_S * C_R$ where $C_N = 2.2/[1.2 + (\sigma'_{v0,a}/P_a)]$ and P_a = 2116 psf (= 101 kPa)
5	$(N_1)_{60cs} = \alpha + \beta(N_1)_{60}$ where: α=0 for FC≤5%, α=exp[1.76 - 190/(FC)^2] for 5%<FC<35%, α=5 for FC≥35%; β=1 for FC≤5%, β=[0.99 + (FC)$^{1.5}$/1000] for 5%<FC<35%, β=1.2 for FC≥35%
4	$CRR_{7.5} = 1/[34-(N_1)_{60cs}] + (N_1)_{60cs} / 135 + 50 / [10(N_1)_{60cs} + 45]^2 - 1/200$ for $(N_1)_{60cs} < 30$
1	$CSR = \tau_{av} / \sigma'_{v0,b} = 0.65 (a_{max}/g)(\sigma_{v0,b}/\sigma'_{v0,b})r_d$
2	$r_d = (1.0 - 0.00765*z)$ for z ≤ 9.15m and $r_d = (1.174 - 0.0267*z)$ for 9.15m < z ≤ 23m, where z is the depth below the design ground surface
24	$MSF = 10^{2.24} / Mw^{2.56}$
31	$K_\sigma = [\sigma'_{v0,b} / P_a]^{(f-1)}$ where f = 0.75 for an assumed relative density of 50%
30	$FS_L = (CRR_{7.5} / CSR) * MSF * K_\sigma$

Calculated By: _____
Date: _____
Checked By: _____
Date: _____

Notes:

1) = cell which is input by the user (cells not highlighted are computed by Excel).
2) N_m = Uncorrected blowcounts measured in the field.
3) FC = measured fines content (% passing the No. 200 sieve) and PI = measured plasticity index.
4) $\sigma'_{v0,a}$ is the vertical effective stress computed using the depth to water at the time of drilling.
5) $\sigma_{v0,b}$ is the total vertical stress for design.
6) $\sigma'_{v0,b}$ is the vertical effective stress computed using the depth to water for design.
7) In the absense of laboratory fines contents, an estimate of the fines content is made based on the field soil description: SP-SM = 5% Fines, Silty or Clayey = 12% Fines, Clays or Silts = 50% Fines.
8) Samples with $(N_1)_{60cs}$ > 30 are considered non-liquefiable and are screened out of the analysis, per Youd et al. (2001). Samples may also be screened out of the analysis for other reasons, which shall be described in the Notes column.
9) The depth reduction factor r_d, as defined in Youd et al. (2001), is only provided for soils shallower than 23 meters. r_d values at samples deeper than 23 meters at design are conservatively assigned an r_d value corresponding to a depth of 23 meters.

Sample ID.	Elev. (ft)	Depth at Drilling (ft)	N_m	Soil Type	FC (%)	Est. FC (%)	PI (%)	$\sigma'_{v0,a}$ (tsf)	C_N	C_E	C_B	C_S	C_R	$(N_1)_{60}$	Analysis Fines Content (%)	$(N_1)_{60cs}$	$CRR_{M7.5}$ at σ'_{v0}=1 atm	Depth at Design (ft)	$\sigma_{v0,b}$ (tsf)	$\sigma'_{v0,b}$ (tsf)	r_d	CSR	MSF	K_σ	Below Analysis Water El?	Screened out of Analysis?	FS_L	Notes
			Note 2		Note 3	Note 7	Note 3	Note 4							Note 7		Note 8		Note 5	Note 6	Note 9					Note 8		
WM0004_031B	21.6	5.0	9	CL	77.2			0.30	1.5	1.4	1.05	1.00	0.80	16	77	24	0.27	5.00	0.30	0.30	0.99	0.17	1.19	1.0	No	Y	100.0	
WM0004_031B	16.6	10.0	8	SM	22.3			0.60	1.2	1.4	1.05	1.00	0.85	12	22	18	0.19	10.00	0.62	0.51	0.98	0.20	1.19	1.0	Yes		1.1	
WM0004_031B	6.6	20.0	10	SM	36.5			1.17	1.0	1.4	1.05	1.00	0.95	13	36	21	0.23	20.00	1.27	0.85	0.95	0.24	1.19	1.0	Yes		1.1	
WM0004_031B	1.6	25.0	12	SP-SM	9.6			1.33	0.9	1.4	1.05	1.00	0.95	15	10	16	0.17	25.00	1.59	1.02	0.94	0.25	1.19	1.0	Yes		0.8	
WM0004_031B	-3.4	30.0	12	SP-SM		5.0		1.50	0.8	1.4	1.05	1.00	1.00	15	5	15	0.16	30.00	1.92	1.19	0.93	0.26	1.19	1.0	Yes		0.7	
WM0004_031B	-8.4	35.0	15	SP-SM	10.1			1.67	0.8	1.4	1.05	1.00	1.00	17	10	19	0.20	35.00	2.24	1.36	0.89	0.25	1.19	0.9	Yes		0.9	
WM0004_031B	-13.4	40.0	18	SP-SM		5.0		1.84	0.7	1.4	1.05	1.00	1.00	20	5	20	0.21	40.00	2.57	1.52	0.85	0.24	1.19	0.9	Yes		1.0	
WM0004_031B	-18.4	45.0	19	SP-SM	6.0			2.01	0.7	1.4	1.05	1.00	1.00	20	6	20	0.21	45.00	2.89	1.69	0.81	0.23	1.19	0.9	Yes		1.0	
WM0004_031B	-23.4	50.0	16	SP-SM		5.0		2.18	0.7	1.4	1.05	1.00	1.00	16	5	16	0.17	50.00	3.22	1.86	0.77	0.23	1.19	0.9	Yes		0.8	
WM0004_031B	-28.4	55.0	26	SP	3.9			2.35	0.6	1.4	1.05	1.00	1.00	25	4	25	0.28	55.00	3.54	2.03	0.73	0.22	1.19	0.8	Yes		1.3	
WM0004_031B	-33.4	60.0	13	SP	4.1			2.52	0.6	1.4	1.05	1.00	1.00	12	4	12	0.13	60.00	3.87	2.20	0.69	0.21	1.19	0.8	Yes		0.6	
WM0004_031B	-38.4	65.0	32	SP		0.0		2.69	0.6	1.4	1.05	1.00	1.00	28	0	28	0.36	65.00	4.19	2.37	0.65	0.19	1.19	0.8	Yes		1.8	
WM0004_031B	-43.4	70.0	50	GP-GM		5.0		2.86	0.6	1.4	1.05	1.00	1.00	41	5	41	N/A	70.00	4.52	2.54	0.60	0.18	1.19	0.8	Yes	Y	100.0	
WM0004_031B	-48.4	75.0	50	GP-GM		5.0		3.02	0.5	1.4	1.05	1.00	1.00	40	5	40	N/A	75.00	4.84	2.71	0.56	0.17	1.19	0.8	Yes	Y	100.0	
WM0004_031B	-53.4	80.0	50	GP-GM	6.5			3.19	0.5	1.4	1.05	1.00	1.00	38	7	39	N/A	80.00	5.17	2.88	0.56	0.17	1.19	0.8	Yes	Y	100.0	

MBK ENGINEERS

Water Resources ◆ Flood Control ◆ Water Rights

TECHNICAL MEMORANDUM

TO: Mark Thomas & Co., c/o Zach Sivilgia, P.E.

PREPARED BY: Michael Archer, P.E.

REVIEWED BY: Don Trieu, P.E.

SUBJECT: Preliminary Hydraulic Impact Analysis for the I Street Bridge Replacement Project

DATE: April 29, 2015

DRAFT

PURPOSE

The purpose of this memorandum is to evaluate the potential impacts of the proposed I Street Bridge Replacement Project on flood stages. The impacts were evaluated for the following flood events:

- 1-in-50 annual exceedance probability (AEP), also known as the 50-year flood or 2% annual chance flood
- 1-in-100 AEP (100-year or 1% annual chance flood)
- 1-in-200 AEP (200-year or 0.5% annual chance flood)

PROJECT DESCRIPTION

The proposed project consists of the construction of a new bridge across the Sacramento River approximately 1,100 feet upstream of the existing I Street bridge (Figure 1) and about 3,000 feet downstream of the American River. The existing bridge will remain in place. A design drawing of the proposed bridge is shown in Figure 2. The bridge is a lift span supported by two towers; the preliminary design has two options for the piers (piers 3 and 4 in Figure 2): 1) a single solid pier at each tower, or 2) four 12-foot-diameter piers at each tower. The design also includes a fender system effectively surrounding the tower piers. A single pier is located on both sides of the lift span between the river bank and the tower (piers 2 and 5 in Figure 2).

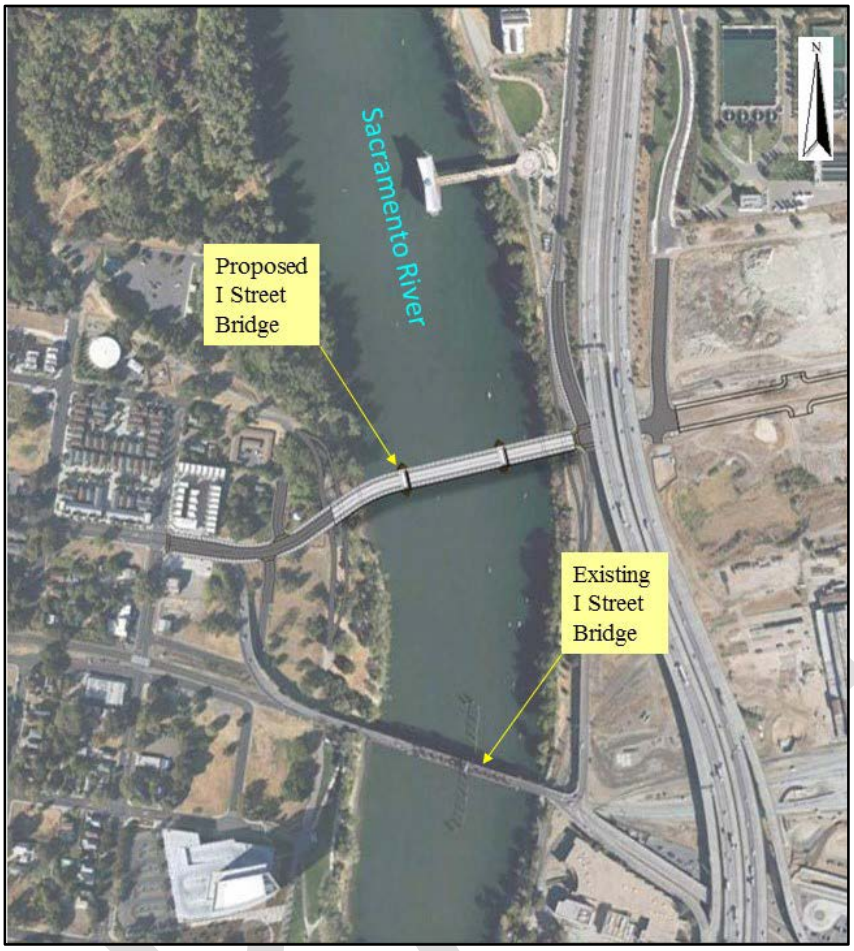


Figure 1. Location Map

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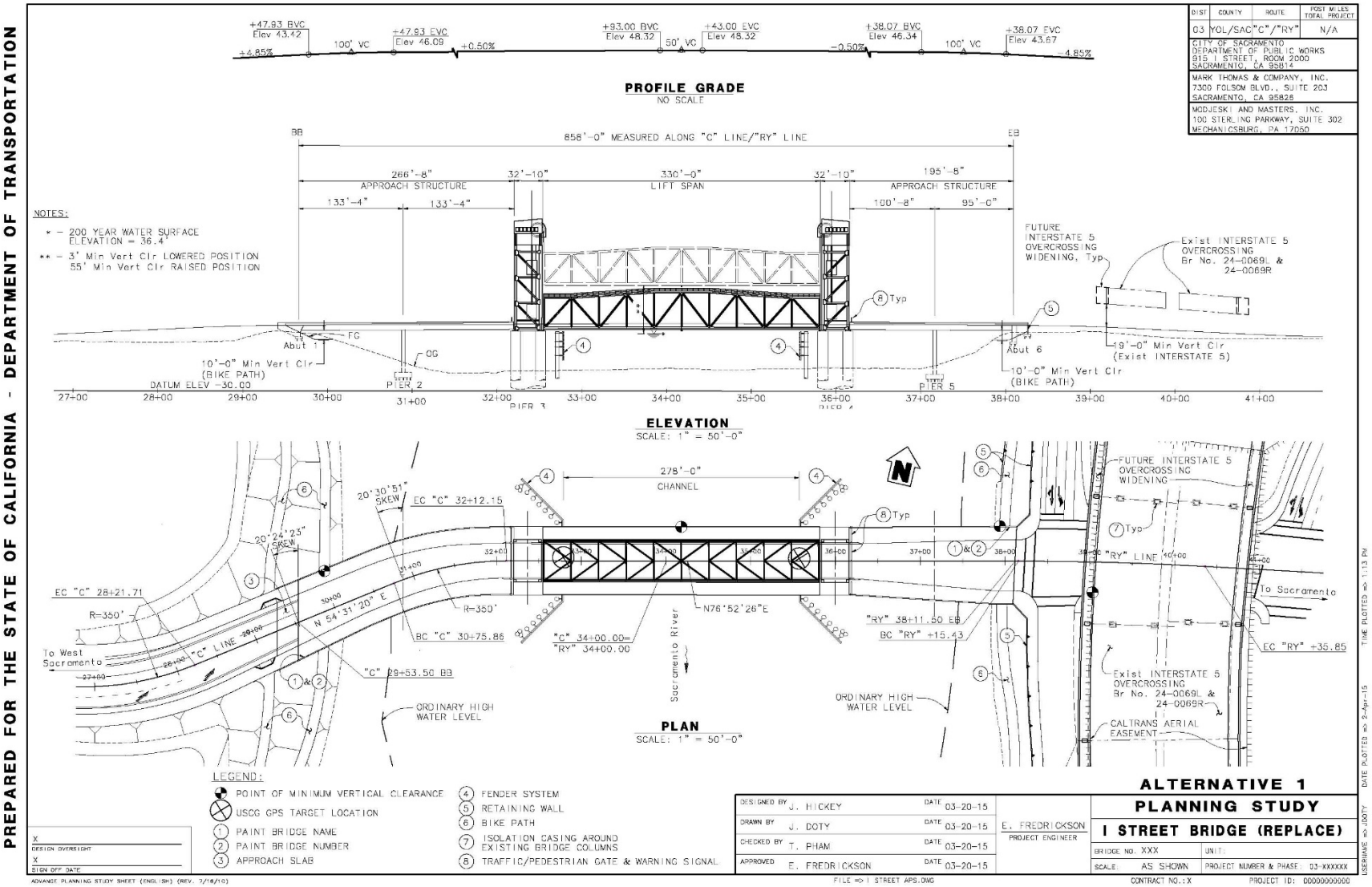

Figure 2. Project Drawing

HYDRAULIC MODEL

The MBK version of the U.S. Army Corps of Engineers (USACE) Sacramento River HEC-RAS hydraulic simulation model was used for this analysis. HEC-RAS software, developed by the USACE Hydrologic Engineering Center, is designed to perform one-dimensional hydraulic calculations for a full network of natural and constructed channels. Version 4.1 of HEC-RAS was used for the analysis presented herein.

The hydraulic model domain extends from Colusa and Oroville Dam in the north to Collinsville, near Suisun Bay, in the south.

The hydraulic model was set up in accordance with the following criteria defined in the California Urban Levee Design Criteria:

- Levees protecting urban areas are assumed to have a minimum crown elevation equal to the 1-in-200 AEP water surface elevation (WSE) plus 3 feet.
- Non-urban State/Federal Project levees are assumed to meet the authorized minimum elevation ("1957 Profile").
- Levees act as weirs and do not breach if overtopped.

HYDROLOGY

The hydrology used for this analysis was developed by USACE for the *Sacramento and San Joaquin River Basins Comprehensive Study* (Comprehensive Study). Updated hydrology for the American River and some of the smaller streams, including Dry Creek, Robla Creek, and Arcade Creek, was developed by USACE for the *American River Watershed Common Features General Reevaluation Report*. The hydrology for the American River assumed that the authorized Folsom Dam Joint Federal Project (JFP) and Water Resources Development Act of 1999 (WRDA 99) Common Features Project, currently under construction, are complete.

The Comprehensive Study hydrology consists of a number of hydrologic inflow data sets representing different storm "centerings." These centerings relied on historical storm patterns in the upstream basin to define the shape and magnitude of the flow contributions from each of the sub-basins, and were designed to stress specific locations within the system. The hydrologic data set used for this analysis was a storm centering designed to stress the Sacramento River at the latitude of the City of Sacramento.

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MODELING OF THE PROJECT CONDITION

The proposed bridge is approximately located at River Station[1] (RS) 59.9. Three new cross sections were added to the hydraulic model so the bridge could be modeled:

1. RS 59.930, located about 110 feet upstream of bridge
2. RS 59.912, located about 10 feet upstream of bridge
3. RS 59.895, located about 10 feet downstream of bridge

The bridge site cross section from the AutoCAD file "C3D14_I Street-Alignments & Profiles.dwg" (from Mark Thomas and Company) was used for the three cross sections. To evaluate the hydraulic effects of a project, it is important that the project components are the only differences between the with- and without-project-conditions models; therefore the three additional cross sections were also added to the without-project-conditions model.

For this analysis, the fenders were assumed to be solid, effectively blocking the tower piers, and therefore representing a worst-case condition with regard to cross-sectional area. The width of the fender perpendicular to the river flow was estimated to be about 65 feet. The current design has a width for piers 2 and 5 of 5.5 feet. The design specifies that the low chord of the bridge deck will be at least 3 feet above the 1-in-200 AEP WSE, so it is not a factor in this analysis. The bridge deck as shown in the hydraulic model is for schematic purposes only and is not representative of expected design elevations. A schematic of the proposed bridge as modeled is provided in Figure 3.

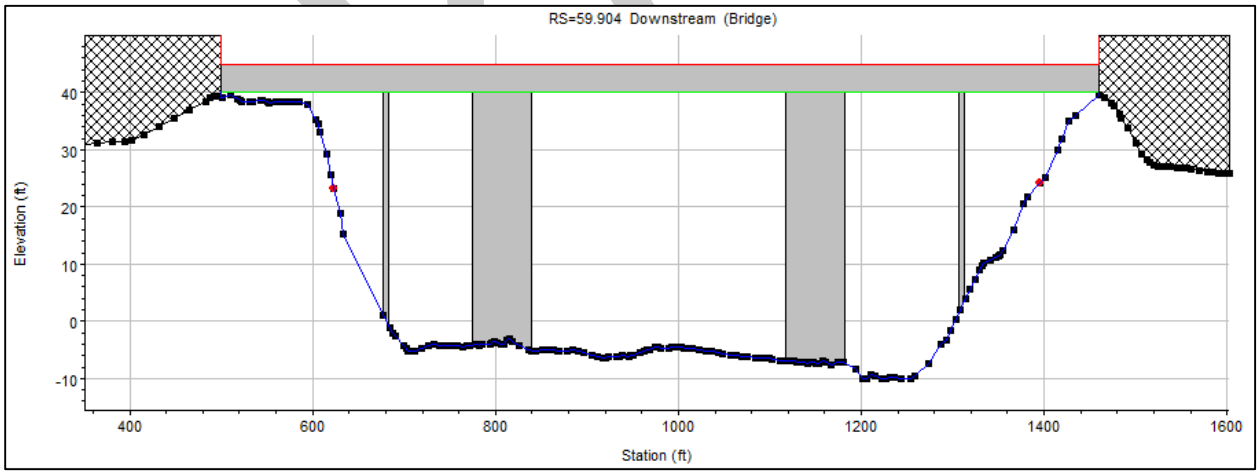

Figure 3. HEC-RAS Schematic of Proposed Bridge

The "Energy (Standard Step)" bridge modeling method was selected for both the low- and high-flow conditions. The Energy method is appropriate for the low-flow condition because there

[1] The river stationing used in this analysis is the river mile stationing developed by USACE for the Sacramento and San Joaquin River Basins Comprehensive Study.

are few piers, so pier blockage is expected to be a more significant factor than pier shape. The high-flow condition does not occur in this analysis so the method selected is not important.

The analysis took into consideration the potential for debris loading on the piers. In accordance with guidance provided to the Central Valley Flood Protection Board (CVFPB) for hydraulic analyses via letter dated July 21, 2014, the debris loading was assumed to be 2 feet in depth for a width twice the width of the pier. Figure 4 shows the bridge cross section with computed water surface and associated debris loading on the piers.

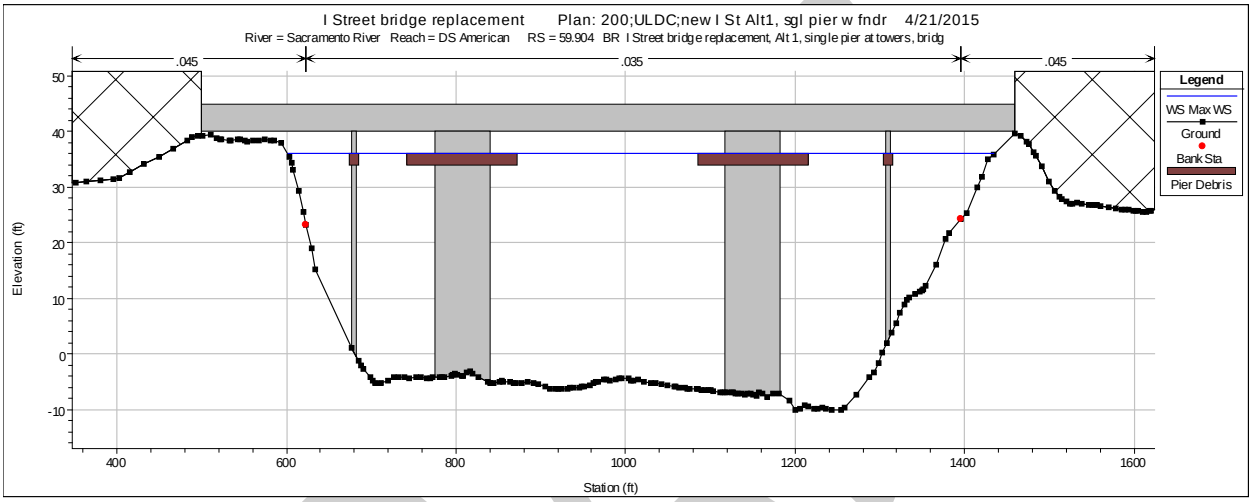

Figure 4. HEC-RAS Schematic of Proposed Bridge with Computed Water Surface and Bridge Pier Debris Loading

RESULTS

The proposed bridge results in a negligible increase in the peak WSE of 0.02 foot immediately upstream of the Project for all three of the flood events evaluated. Downstream of the Project there is a 0.06- to 0.07-foot reduction in the peak WSE. A profile plot of the computed change in water surface due to the Project for the Sacramento River from the Natomas Cross Canal to Sutter Slough is provided in Figure 5.

The analysis was also made without the fenders in place to evaluate the two configurations for the tower piers: either a single, solid pier or a group of four piers. For both these conditions, the greatest WSE increase was 0.01 foot. Downstream of the Project there was a reduction in the WSE that ranged from 0.03 to 0.06 foot.

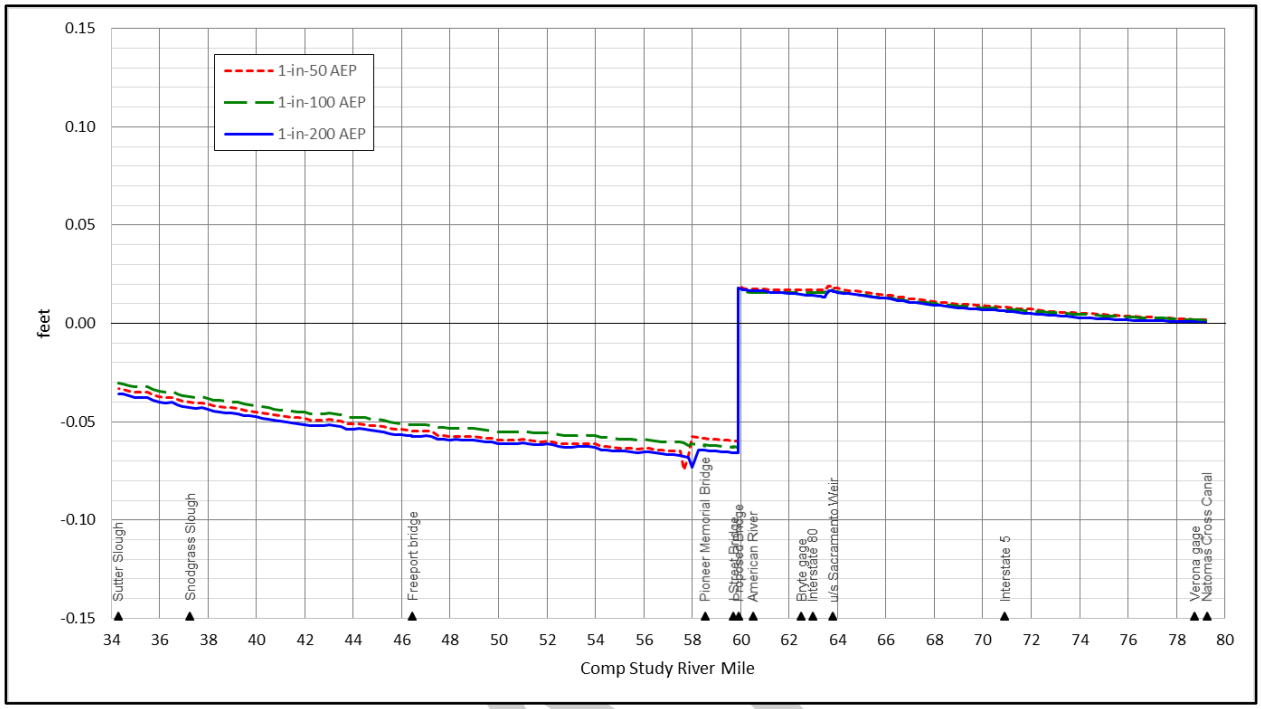

Figure 5. Project Effect on Maximum WSE in Sacramento River

The reduction in WSE downstream of the Project is due to a reduction in the peak flow in the Sacramento River downstream of the American River caused by the small increase in the WSE upstream of the Project. The increase in WSE upstream of the Project translates to an increase at the American River, thereby reducing the percentage of American River flow that goes downstream in the Sacramento River and increasing the percentage that flows upstream to the Sacramento Weir. This effect is shown by the peak flow summary provided in Table 1. As with the effect on the WSE, the effect on the flows is negligible.

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Table 1. Effect of Project on Peak Flows at Sacramento River and American River Junction and in Sacramento Bypass

Flood Event (AEP)	Location	Peak Flow (cfs)		Change in Peak Flow	
		Without Project	With Project	cfs	Percent
1-in-50	Sacramento River downstream of American River	114,440	114,080	-410	-0.36%
	Sacramento River upstream of American River[1]	18,930	19,270	+340	+1.80%
	Sacramento Bypass	111,110	111,480	+370	+0.33%
1-in-100	Sacramento River downstream of American River	118,280	117880	-400	-0.34%
	Sacramento River upstream of American River[1]	19,400	19,760	+360	+1.86%
	Sacramento Bypass	114,690	115,020	+330	+0.29%
1-in-200	Sacramento River downstream of American River	131,030	130,580	-450	-0.34%
	Sacramento River upstream of American River[1]	45,520	45,930	+410	+0.90%
	Sacramento Bypass	149,790	150,170	+380	+0.25%

Key: AEP = annual exceedance probability; cfs = cubic feet per second
Notes:
1. The peak flow for this location is the peak going from the American River to the Sacramento Weir.

Mike Archer

MA/jw
3462.0/MBK TM - I St bridge replacement HIA 2015-04-27 DRAFT_JW

DRAFT

INITIAL SITE ASSESSMENT
I STREET BRIDGE REPLACEMENT PROJECT

Sacramento, California and
West Sacramento, California

Prepared by:

BLACKBURN CONSULTING
2491 Boatman Ave
West Sacramento, CA 95691

March 2016

Prepared for:

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Geotechnical ▪ Geo-Environmental ▪ Construction Services ▪ Forensics

BCI File No. 2584.X
March 8, 2016

Mr. Zach Siviglia
Mark Thomas & Co.
7300 Folsom Blvd., Suite 203
Sacramento, CA 95826

Subject: **INITIAL SITE ASSESSMENT (ISA)**
I Street Bridge Replacement Project
Sacramento and West Sacramento, California

Dear Mr. Siviglia,

Blackburn Consulting (BCI) prepared this Initial Site Assessment (ISA) for the I Street Bridge Replacement project located in Sacramento and West Sacramento, California. We completed this work in accordance with our agreement dated July 14, 2014. This report's purpose is to identify hazardous and potentially hazardous materials issues that may significantly impact the proposed project. This report addresses the property both within and immediately adjacent to the proposed improvement area.

As always, BCI appreciates the opportunity to be part of your team. Please call if you have questions or require additional information.

Sincerely,

BLACKBURN CONSULTING

Laura Long
Environmental Project Manager

Patrick Fischer, PE, CEG
Engineering Geologist, Principal

INITIAL SITE ASSESSMENT
I STREET BRIDGE REPLACEMENT PROJECT
Sacramento and West Sacramento, California

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INITIAL SITE ASSESSMENT
I STREET BRIDGE REPLACEMENT PROJECT
Sacramento and West Sacramento, California

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ATTACHMENT 1 – Entek Hazardous Material Inspection Report

INITIAL SITE ASSESSMENT
I STREET BRIDGE REPLACEMENT PROJECT
Sacramento and West Sacramento, California

Abbreviations and Acronyms

AASHTO	American Association of State Highway and Transportation Officials
ACM	Asbestos Containing Material
ADL	Aerially Deposited Lead
ASTM	American Society of Testing and Materials
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
Caltrans	California Department of Transportation
CCA	Central Corridor Study Area
CEQA	California Environmental Quality Act
CS	Central Shops Study Area
DCA	1, 2-dichloroethane
DCE	1, 2-dichloroethene
DTSC	Department of Toxic Substance Control
DWR	California Department of Water Resources
EDR	Environmental Data Resources
EHD	Sacramento County Environmental Health Department
FHWA	Federal Highway Administration
HBP	Highway Bridge Program
I-5	Interstate 5
ISA	Initial Site Assessment
LCP	Lead Containing Paint
LGWSA	Lagoon Groundwater Study Area
LUC	Land Use Covenant
LUST	Leaking Underground Storage Tank
MCL	Maximum Contaminant Level
MGP RIR	Manufactured Gas Plant Remedial Investigation Report
MGP	Manufactured Gas Plant
msl	mean sea level
MTP/SCS	Metropolitan Transportation Plan/Sustainable Communities Strategy
NEPA	National Environmental Policy Act
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NFA	No Further Action
NFA	No Further Action/Assessment
NPL	National Priorities List
NSA	Northern Shops Study Area
PA/ED	Project Approval and Environmental Document
PCB	Polychlorinated Biphenyl
PCE	tetrachloroethene, perchloroethylene
PRG	Preliminary Remediation Goal

Railyards	Sacramento Railyards
REC	Recognized Environmental Condition
RIR	Remedial Investigation Report
ROW	Right-of-Way
RWQCB	Central Valley Regional Water Quality Control Board
SACOG	Sacramento Area Council of Governments
SGMP	Soil & Groundwater Management Plan
SMP	Soil Management Plan
SP	South Plume Study Area
SSA	Sacramento Station Study Area
SSI	Site Summary Investigation
SVOCs	Semi-volatile Organic Compounds
TCE	trichloroethylene
TPH	Total Petroleum Hydrocarbon
TPH-d	Total Petroleum Hydrocarbon as diesel
TPH-g	Total Petroleum Hydrocarbon as gasoline
TPH-mo	Total Petroleum Hydrocarbon as motor oil
UPRR	Union Pacific Railroad
USC	United States Code
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds
YCEHS	Yolo County Environmental Health Services

EXECUTIVE SUMMARY

Blackburn Consulting (BCI) prepared this Initial Site Assessment (ISA) for Mark Thomas & Company (MTCo) for the I Street Bridge Replacement project which spans the Sacramento River between the cities of Sacramento and West Sacramento, California. The City of Sacramento, in cooperation with the City of West Sacramento and the California Department of Transportation (Caltrans), proposes to construct a new bridge over the Sacramento River to replace the vehicle crossing that is currently accommodated by the existing I Street Bridge in order to remove a series of functionally obsolete or structurally deficient bridges (i.e., approach structures). The new connection also would reduce future traffic congestion, improve operations and safety, serve multiple modes of transportation, and comply with current American Association of State Highway and Transportation Officials (AASHTO), Caltrans, and local agency design standards.

The project is subject to state and federal environmental review requirements because of use of federal Highway Bridge Program (HBP) funds from the Federal Highway Administration (FHWA). Accordingly, project documentation is being prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The City of Sacramento is the lead agency under CEQA, with the City of West Sacramento as a responsible agency, and Caltrans is the lead agency under NEPA. The FHWA's other responsibilities for environmental review, consultation, and any other action required in accordance with applicable federal laws for this project will be carried out by Caltrans under its assumption of responsibility pursuant to 23 United States Code (USC) 327.

The purpose of this ISA is to identify Recognized Environmental Conditions[1] (RECs), Historical Recognized Environmental Conditions (HRECs), and potential RECs, collectively referred to herein as RECs, that may be present within and/or adjacent to the project limits. We prepared this report in general conformance with the American Society of Testing and Materials (ASTM) Standard E1527-13, *"Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process"*.

The following section summarizes in table format the key issues identified within and adjacent to the project limits. BCI further discusses the conditions in the body of this report.

Partial or Complete Acquisition Parcels with RECs

The project requires temporary and permanent property acquisitions along C Street, 3rd Street, and 2nd Street within the City of West Sacramento, and along Railyards Boulevard, Jibboom

[1] BCI uses the term Recognized Environmental Condition (REC) in general compliance with ASTM E1527-13, which defines the meaning as *"The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property (1) due to any release to the environment, (2) under conditions indicative of a release to the environment or (3) under conditions that pose a material threat of a future release to the environment. The term is not intended to include de minimus conditions that generally do not present a threat to human health or the environment and generally would not be the subject of an enforcement action if brought to the attention of the appropriate regulatory agencies. Conditions determined to be de minimus are not recognized environmental conditions*."

Street, Bercut Drive, and I Street within the City of Sacramento. Comparison of these areas to identified REC sites, results in the following table of acquisition parcels with RECs that may impact project improvements.

For each acquisition parcel with known and/or potential RECs, Table 1 contains the assessor's parcel number (APN), address, current and/or former land use, REC description and PA/ED risk classification[2], and recommended action. Depending on the location of the right-of-way (ROW) to be acquired, site-specific assessments may be warranted for these parcels. In addition to the summary in Table 1, each of these sites are mapped on Figures 2 (A, B and C) and discussed in Section 4 of this report.

Table 1

Acquisition or Partial Acquisition Parcels With Known and/or Potential RECs

APN Address	Land Use Present/ Former	Figure	REC* Risk Class	Summary/Recommended Action*
010-102-005 205 2nd Street	Levee and access road/ Former historical development	Site A Figure 2a	Leach field, septic tank and/or buried heating oil tank ***Low***	Historical development located at this parcel from the 1890's until the 1970's. *Recommendation:* Plans for construction and/or partial acquisition should account for the potential to encounter a leach field, septic tank and/or buried heating oil tank
010-102-010 010-372-003 010-372-002 010-372-001 No street address	Levee, access road and water tower/ Former historical development	Site B Figure 2a	Leach field, septic tank and/or buried heating oil tank ***Low***	Historical development located at this parcel from the 1890's until the 1970's. *Recommendation:* Plans for construction and/or partial acquisition should account for the potential to encounter a leach field, septic tank and/or buried heating oil tank.
010-371-005 010-371-006 305 3rd Street (Old Police Building)	Vacant Lot/ Former Old Police Building	Site C Figure 2a	Soil (nickel and lead) and groundwater (nickel, lead, cadmium, chromium) impacts ***High***	Known impacts to soil and groundwater, however, sampling locations are not within the proposed ROW improvement area for this project. *Recommendation*: Conduct a Phase II assessment within the proposed acquisition area.

[2] Risk Class is based on the Caltrans Project Development Procedures Manual (Chapter 18, February 2006) guidelines, which traditionally attempt to rank risk into high, medium and low, based on the potential impact on an objective.

Table 1

Acquisition or Partial Acquisition Parcels With Known and/or Potential RECs

APN Address	Land Use Present/ Former	Figure	REC* Risk Class	Summary/Recommended Action*
010-482-011 301 C Street and 300 3rd Street	Vacant Lot/ Former service station (Dorris Shell Station)	Site G Figure 2a	Potential USTs, TPH-g, TPH-d, TPH-mo ***High***	No record of the presence and/or removal of USTs at the former service station. *Recommendation*: Conduct site inspection, in-depth record review and owner interview; if no additional information is found, conduct a Phase II assessment within the proposed acquisition area.
010-101-004 217 3rd Street	Residential /Former laundry	Site H Figure 2a	Solvents ***Low***	The parcel is identified as a "laundry facility" on the 1915 Sanborn Map. *Recommendation*: Conduct site inspection and owner interview; a Phase II assessment may be recommended based on findings.
Sacramento Railyards	Railyards development/ Northern Shop Study Area (NSA)	Site M Figure 2b	Known soil impacts and potential groundwater impacts. TPH, VOCs, SVOCs, metals ***High***	Soil within the NSA is certified and DTSC approved Remedial Goals have been achieved. Groundwater assessment and remediation activities are ongoing and are the responsibility of UPRR. *Recommendation*: Conduct all operations in compliance with the LUC of 2015 and Railyards Soil and Groundwater Management Plan. Impacts to groundwater have not been established by UPRR, therefore, a Phase II assessment to the depth of construction is recommended. All Phase II sampling plans must be approved by DTSC.
001-0190-007 001-0210-018 002-0010-023 Adjacent to Jibboom Street	Levee, bike path, Jibboom Park/Former Associated Metals (Jibboom Junkyard), warehouse	Sites O, P and Q Figure 2b	TPH, metals, PCBs ***High***	APN 001-0190-007 may be within the former Associated Metals footprint. APN 001-0210-018 and APN 002-0010-023 are within the footprint historical industrial development. *Recommendation:* Conduct a Phase II assessment within the proposed acquisition area.

Table 1				
Acquisition or Partial Acquisition Parcels With Known and/or Potential RECs				
APN Address	**Land Use Present/ Former**	**Figure**	**REC* Risk Class**	**Summary/Recommended Action***
Sacramento Railyards	Roadway/ Former Manufactured Gas Plant (MGP)	Site N Figure 2b	Soil and Groundwater impacted with TPH, metals, VOCs, and SVOCs ***High***	Soil and groundwater conditions are characterized in the 2015 Final MGP RIR. Remediation of soil and groundwater is on-going. Impacts in the upper 10-feet are minimal; however, areas adjacent to footings and support columns for Jibboom Street and I-5 may be significantly impacted. *Recommendation:* If remediation is complete and soils are certified prior to construction, comply with applicable LUC and/or guidance documents. If site characterization is not complete, conduct a Phase II assessment within the depth and area of construction impacts.
Sacramento Railyards Existing I Street Bridge viaduct	Sacramento Station Study Area (SSA)	Site X Figure 2c	Soil impacted with metals and TPH ***Medium***	Soil within the SSA is certified and the DTSC approved Remedial Goals have been achieved. Groundwater assessment and remediation activities are ongoing and are the responsibility of UPRR. Project improvements are shallow and are not expected to extend to groundwater. *Recommendation*: Conduct all operations in compliance with the LUC of 2015, and Railyards Soil and Groundwater Management Plan.
Caltrans ROW at Bridge approach from C Street	Caltrans ROW bridge approach and 2nd Street south of C Street/vacant lot	Site Y Figure 2a and 2c	Adjacent to Firehouse Block with known soil and groundwater impacted with metals ***Medium***	Additional ROW will be acquired along C Street at this parcel which is currently developed with the I Street Bridge approach. Removal of existing bridge approach is to occur at this site. Adjacent to a site with known soil and groundwater contamination. *Recommendation*: Conduct a Phase II assessment for metals within the depth of construction impacts.

*Applicable Abbreviations and Acronyms are listed in table format preceding the Executive Summary.

Adjacent and General Vicinity REC Sites

We identified sites with RECs which, based on the preliminary plan alternatives, are located immediately adjacent to partial or complete acquisition parcels or existing ROW, as well as potentially significant REC sites in the general vicinity of the project alignment. Based on the location of the proposed project and currently available information, none of these parcels will require partial or complete acquisition for this project. However, if plans for ROW or acquisition change to include one or more of these properties, further review and investigation of potential hazardous materials or petroleum hydrocarbon impacts is recommended.

These sites are summarized in Table 2 below and are further discussed in the body of the report. In addition to the summary in Table 2, each of these sites are mapped on Figures 2 (A, B and C).

Table 2

Parcels Adjacent to Acquisition Parcels and/or Existing ROW With Known and/or Potential RECs

APN Partial Acquisition Address	Land Use Present/ Former	Figure	REC* Risk Class	Summary/Recommended Action*
010-371-004 317 3rd Street Adjacent parcel acquisition	Abandoned Fire Station/Former Fire and Police Station	Site D, Figure 2a	Soil (nickel and lead) and groundwater (nickel, lead, cadmium, chromium) ***High***	Known impacts to soil and groundwater. *Recommendation:* If ROW acquisition or project improvements include this parcel, conduct a Phase II assessment within the proposed acquisition/improvement area.
010-371-003 319 3rd Street Adjacent parcel acquisition	Vacant lot/ Former Capitol Plating facility	Site E, Figure 2a	Soil (nickel and lead) and Groundwater (nickel, lead, cadmium, chromium, solvents) contamination ***High***	Former metal plating facility. Known impacts to soil and groundwater. *Recommendation:* If ROW acquisition or project improvements include this parcel, conduct a Phase II assessment within the proposed acquisition/improvement area.

Table 2

Parcels Adjacent to Acquisition Parcels and/or Existing ROW With Known and/or Potential RECs

APN Partial Acquisition Address	Land Use Present/ Former	Figure	REC* Risk Class	Summary/Recommended Action*
010-495-014 424 C Street and 624 5th Street	Original garage structure and parking lot/former active service station (Martinez Gulf Station)	Site I on Figure 2a	UST (removed) Petroleum Hydrocarbons, Metals ***Medium***	Four USTs were removed in 1987. No documentation of a soil assessment at tank closure was located. *Recommendation*: If ROW acquisition or project improvements include this parcel, conduct a Phase II assessment within the proposed acquisition/improvement area.
010-481-001 427 C Street	Vacant lot developed with garden/ former service station (Gary's Mohawk Station)	Site J on Figure 2a	LUST Petroleum Hydrocarbons ***Low***	Three USTs were removed in 1990. Remediation occurred 1993-2010. Records indicate soil remediation is complete. *Recommendation*: If site acquisition occurs, conduct an in-depth records review to confirm remediation levels.
010-193-005 521 C Street 519 C Street	Golden Eagle Garage and residence/ former active service station (Golden Eagle Garage)	Site K on Figure 2a	Petroleum Hydrocarbons, ***Medium***	Three gasoline USTs were registered at this site. Two USTs were removed under YCEHS direction. No records of the third UST removal were located. *Recommendation*: If ROW acquisition or project improvements include this parcel, conduct a Phase II assessment within the proposed acquisition/improvement area.
101-494-017 500 C Street	Market and Deli/ former active service station (Hudson Oil Station)	Site L on Figure 2a	Petroleum Hydrocarbons, Automotive Fluids ***Medium***	Four USTs were removed in 1987; soil analysis indicated elevated levels of TPH-g. YCEHS authorized the soil to be stockpiled, aerated and placed back into the excavation. A NFA letter was issued. *Recommendation*: If ROW acquisition or project improvements include this parcel, conduct a Phase II assessment within the proposed acquisition/improvement area.

Table 2				
Parcels Adjacent to Acquisition Parcels and/or Existing ROW With Known and/or Potential RECs				
APN Partial Acquisition Address	**Land Use Present/ Former**	**Figure**	**REC* Risk Class**	**Summary/Recommended Action***
230-260 Jibboom Street	Jibboom Street Park, I-5 and Jibboom Street/ Former Associated Metals (aka Jibboom Junkyard)	Site S Figure 2b	Metals, PCBs ***Medium***	Previous investigation and remediation of this Superfund site did not include areas of the site between Jibboom Street and the west edge of Bercut Drive. *Recommendation:* Phase II assessment for areas where construction activities will result in soil excavation in this area.

*Applicable Abbreviations and Acronyms are listed in table format preceding the Executive Summary.

General Contamination Issues

Asbestos Containing Materials (ACM) and Lead Based Paint (LBP) at the existing I Street Bridge and Approach Structures

The United States Environmental Protection Agency, National Emission Standards for Hazardous Air Pollutants (USEPA NESHAP), 40 CFR Part 61 – Nov 20, 1990, requires an owner or operator of a demolition or renovation project to thoroughly inspect the affected facility or part of the facility where the demolition or renovation operation will occur for the presence of ACM prior to the commencement of that project.

The I Street Bridge and its associated approaches are proposed for demolition or modification. BCI had the bridge and approaches surveyed for ACM and LCP by Entek Consulting Group (Entek), a California Certified Asbestos Consultant and certified Lead Inspector/Assessor. Findings of the surveys are summarized below and the complete Hazardous Materials Survey Final Report (dated 14 May 2015) is in Attachment 1. The report concluded that ACM is present in the railing gaskets and the fastener sealants. Specifics pertaining to individual materials are presented in the attached report.

Entek investigated existing paints and applied coatings associated with the bridge to determine if lead was present in these materials. Three paints/locations were determined to have paint containing more than 5,000 ppm lead and are classified as lead-based paint; these are:

1. Silver paint on metal bridge structure
2. Black paint on metal bridge structure
3. White paint on metal northeast approach

In addition, the gasket located at the base of the light boxes on the northeast approaches was determined to be pure lead. Precaution should be used when handling this material.

Consequently, any demolition or modification of the bridge and/or approach structures within the project area will require that an appropriate ACM and Lead Compliance Plan be developed. Abatement of LCP and/or ACM shall be conducted, as necessary, by contractors certified to perform such work in accordance with state and federal regulations.

ACM/LCP in Buildings/Residences

The ACM/LCP assessment did not include buildings within the project limits. Typically pre-demolition surveys for occupied buildings are conducted at a later date. Any structure constructed pre-1980 has the potential to contain ACM/LCP materials

Recommendation: Any structure identified for modification and/or demolition that was constructed pre-1980, must be surveyed by a certified Asbestos Inspector prior to building demolition/modification.

Aerially Deposited Lead (ADL)

ADL has been found to occur in soils adjacent to highways and high use roadways. The lead is presumably from the historical use of leaded gasoline and subsequent exhaust emissions. There is potential for encountering ADL during construction and grading activities within the proposed project limits in West Sacramento along C Street, 2nd Street and at the bridge approach/viaduct leading from C Street. A majority of the area adjacent to C Street is covered sidewalk; therefore, an ADL assessment would be limited to areas with exposed soils in that area.

There is potential to encounter ADL during construction and grading activities within the proposed project limits in Sacramento at the bridge approach/viaduct leading from I Street, and along Jibboom Street and Bercut Drive. These roadways have been present in various alignments since 1916 and, therefore, have the potential to be impacted with ADL. BCI conducted an ADL Assessment in 2009 for portions of Jibboom Street north of the current project limits. The 2009 Assessment results indicate that soils from the tested area would be classified as either non-hazardous or as soil acceptable for management in accordance with DTSC and RWQCB.

In addition, the bridge landing will be located within the Sacramento Railyards. This area is not likely to exhibit elevated concentrations of ADL from typical automobile emissions; however, historical operations at the Railyards has impacted the site with metals including lead. Approved total lead concentrations for soils within the railyards will be guided by the Remediation Goals set for each study area by DTSC.

Recommendation: Conduct an ADL study within the project limits at the following locations:

- Along unpaved areas of C Street in West Sacramento
- 2nd Street in West Sacramento
- Adjacent to and below the bridge approach/viaduct in West Sacramento
- Along Jibboom Street
- Adjacent to and below the bridge approach/viaduct in Sacramento

Within the Railyards property, conduct all operations in compliance with the LUC of 2015, and Railyards Soil and Groundwater Management Plan.

1. INTRODUCTION

In accordance with our proposal dated March 8, 2013, Blackburn Consulting (BCI) prepared this ISA for proposed improvements at the I Street Bridge Replacement Project in Sacramento and West Sacramento, California. The purpose of this assessment is to identify recognized environmental conditions[3] (RECs), potential RECs, and historical RECs, herein collectively referred to as "RECs" that may affect the proposed property acquisition and/or project construction. We prepared this report in general conformance with the ASTM Standard E1527-13, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*.

To conduct this ISA, BCI:

- Conducted a site visit to observe current land use and indications of potential contamination for those parcels that may be impacted by improvements, and view publicly accessible portions of the adjacent properties;
- Reviewed prior environmental reports prepared for the subject area;
- Reviewed historical aerial photographic, topographic, and Sanborn maps and City Directory coverage of the site and surrounding properties to identify past and present land use for indications of potential sources of contamination;
- Reviewed available California Department of Toxic Substances Control EnviroStor and State Water Resources GeoTracker online database information;
- Reviewed available case files at Yolo County Environmental Health Services (YCEHS), Sacramento County Environmental Health Department (SCEHD), and Central Valley Regional Water Quality Control Board (RWQCB);
- Reviewed commercial database of federal, state, and county records for indications of the use, misuse, or storage of hazardous materials at or adjacent to the acquisition parcels. The database was provided by Environmental Data Resources, Inc. (EDR) of Southport, Connecticut; and
- Reviewed the general site geology, ground water, and soil conditions through published maps and literature.

[3] BCI uses the term Recognized Environmental Condition (REC) in general compliance with ASTM E1527-13, which defines the meaning as *"The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property (1) due to any release to the environment, (2) under conditions indicative of a release to the environment or (3) under conditions that pose a material threat of a future release to the environment. The term is not intended to include de minimus conditions that generally do not present a threat to human health or the environment and generally would not be the subject of an enforcement action if brought to the attention of the appropriate regulatory agencies. Conditions determined to be de minimus are not recognized environmental conditions*."

2. PROJECT DESCRIPTION AND LOCATION

2.1 Description and Location

The City of Sacramento, in cooperation with the City of West Sacramento and Caltrans, proposes to construct a new bridge over the Sacramento River to replace the vehicle crossing that is currently accommodated by the existing I Street Bridge in order to remove a series of functionally obsolete or structurally deficient bridges (i.e., approach structures). The new connection also would reduce future traffic congestion, improve operations and safety, serve multiple modes of transportation, and comply with current AASHTO, Caltrans, and local agency design standards.

The project is subject to state and federal environmental review requirements because of use of federal HBP funds from the FHWA. Accordingly, project documentation is being prepared in compliance with both CEQA and NEPA. The City of Sacramento is the lead agency under CEQA, with the City of West Sacramento as a responsible agency, and Caltrans is the lead agency under NEPA. The FHWA's other responsibilities for environmental review, consultation, and any other action required in accordance with applicable federal laws for this project will be carried out by Caltrans under its assumption of responsibility pursuant to 23 USC 327.

The proposed project is located over the Sacramento River between the cities of Sacramento and West Sacramento, approximately 1,000 feet north of the existing I Street Bridge. The project limits starting within the City of Sacramento consist of Railyards Boulevard from 200 feet east of Bercut Drive on the east, continuing west over the Sacramento River into the City of West Sacramento along C Street, and terminating approximately 100 feet west of the 5th Street intersection. The project limits also extend along Bercut Drive approximately 500 feet north of Railyards Boulevard, along Jibboom Street 550 feet north of Railyards Boulevard and 300 feet south of Railyards Boulevard, along 3rd Street 50 feet north and south of C Street, along 4th Street 50 feet north and south of C Street, and along 5th Street 50 feet north and south of C Street. The total length of the project is approximately 0.42 mile along C Street and Railyards Boulevard.

This project is included in the Sacramento Area Council of Governments (SACOG) 2035 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS).
The project requires temporary and permanent property acquisitions along C Street, 3rd Street, and 2nd Street within the City of West Sacramento and along Railyards Boulevard, Jibboom Street, Bercut Drive, and I Street within the City of Sacramento.

Along C Street, temporary and permanent acquisitions would be required along the south side of the roadway to accommodate the construction of standard shoulders, bike lanes, and sidewalks—from the intersection of 4th Street to the Sacramento River.
Along 3rd Street and 2nd Street, temporary and permanent acquisitions would be needed from the Union Pacific Railroad on the south, to just north of the B Street intersections, for construction of the proposed roadway and levee improvements.

Along Railyards Boulevard, Jibboom Street, and Bercut Drive, temporary and permanent acquisition would be needed from the current state-owned right-of-way for I-5, for construction of the roadway. In addition, temporary and permanent acquisitions would be needed along Jibboom Street for the proposed temporary detour road and Class I bikeway improvements. Temporary acquisition would be required along the existing I Street connection to facilitate removal of the existing viaduct structures. Due to the limited space available in Old Sacramento, it is anticipated that construction activities would occur from the parking lot at the intermodal station.

Figure 1 is a Vicinity Map and Figure 2 is a Site Plan of the proposed project area.

2.2 Current Land Use

West Sacramento: The project area consists of existing roadway, curb, gutter, and/or sidewalk areas associated with C Street from 6th Street to 2nd Street. This area is a mixed use area with commercial (market, deli), residential, and vacant lots. The new bridge approach extends across the existing levee which is generally open space with a gravel access road. A small, fenced area around the West Sacramento River Walk Tower (which will be relocated as part of this project) is located on the west side of the levy. This portion of the site is bordered by the Sacramento River to the east. The project area also includes the removal of the existing bridge approach from C Street and the removal of a portion of 2nd Street.

Sacramento: The project area consists in part, of existing levee, roadway, curb, gutter, and/or bike paths associated with Jibboom Street. Project improvements also include a proposed connection to Railyards Boulevard in the Sacramento Railyards (Railyards), where the connection to the new bridge will be completed beneath the existing underpass at I-5. The remaining portion of the project is developed with I-5, Jibboom Street and the southern connection to Bercut Drive. The area to the north along Jibboom Street is developed with the historical PG&E building, water intake facilities, service stations, and restaurants; and along Bercut Drive with the Sacramento River Treatment Plant, and Communication Center. The areas to the south and east are part of the 240-acre Railyard site. The site is bordered by the Sacramento River to the west.

2.3 Topography

West Sacramento: The topography within and surrounding the project area is generally flat. The site elevation is approximately 30 to 39 feet above mean sea level (msl) based on Google Earth Imagery, dated July 2, 2014.

Sacramento: The topography within the study area is generally flat with the site elevation approximately 29 to 36 feet above msl based on Google Earth Imagery, dated July 2, 2014.

2.4 General Geologic Conditions

The site lies within the Great Valley Geomorphic Province of California, which is a large, elongate, northwest-trending structural trough. The Province is subdivided into two major

divisions designated the Sacramento and San Joaquin Valleys. These valleys have been filled to their present elevation with thick sequences of sediment, ranging in age from Jurassic to present day, creating a nearly flat-lying alluvial plain that extends from the Tehachapi Mountains in the south to the Klamath Mountains in the north. The western and eastern boundaries of this province are formed by the California Coast Ranges and the Sierra Nevada, respectively. The study area is located on an alluvial plain approximately 0.4 miles south-southeast of the confluence of the American and Sacramento Rivers. The underlying deposits are mapped by Wagner et al. (1981) as Quaternary Levee and Channel deposits which are expected to consist of interbedded sand, silt, clay, and some gravel layers.

2.5 Surface Water, Groundwater and Wells

West Sacramento: The prevailing groundwater flow direction in West Sacramento is to the northeast, though flow directions vary both locally and seasonally. The study area is adjacent to the Sacramento River, where groundwater flow direction is controlled by the Sacramento River height, with flow switching 180 degrees toward and away from the river. This would suggest an alternating east-west flow direction in the general project area. BCI reviewed groundwater level data made available at California Department of Water Resources (DWR) website www.water.ca.gov/waterdatalibrary. The groundwater beneath the site rises to within four feet of the ground surface for up to six months of the year. Depth to groundwater during the rest of the year is approximately 12-28 feet below ground surface. Surface/storm water is directed by sidewalk curb and drains. The general flow direction is to the south and east. One Federal USGS well is located within the project limits. This well is adjacent to the West Sacramento River Walk water tower.

Sacramento: Groundwater beneath the site is hydraulically connected to the Sacramento River. The river serves as a hydraulic connection, and presumably a barrier, to the potable groundwater that is on the western side of the Sacramento River. Flow direction is presumed to fluctuate semiannually according to the river stage (similar to the West Sacramento side). BCI reviewed general groundwater level data made available at the DWR website www.water.ca.gov/waterdatalibrary and site specific groundwater monitoring well data presented in the Final Remedial Investigation Report, Manufactured Gas Plant Study Area (MGP RIR), dated April 2015. The groundwater beneath the site historically rises to within five feet of the ground surface for up to six months of the year. Depth to groundwater during the rest of the year is approximately 15-30 feet below ground surface. Groundwater elevation is also influenced by groundwater recharge due to infiltration of water lost from the Sacramento County water filtration plant.

Natural surface water flow directions have been altered by construction of roadway and structures. The general flow direction appears to be to the south and west. There are three Federal USGS wells, one Federal Water Supply System, and ten State Database wells located within a one mile radius of the project area. In addition, multiple groundwater monitoring wells related to on-going site characterization are within and adjacent to the Railyards.

2.6 Historic Land Use

I Street Bridge: The first bridge across the Sacramento River was built in 1858 for auto traffic. The bridge extended from Broad Street (now abandoned) in Sacramento to D Street in West Sacramento. In 1870, the California Pacific Railroad Company (later Southern Pacific) constructed the first railroad bridge 400 feet from the 1858 bridge. In 1893, Southern Pacific and the counties of Sacramento and Yolo began the construction of a joint bridge for railroad and highway use, which was completed in 1895 (Red Bridge) This bridge was situated about 300 feet down-stream of the current day railroad-highway bridge. The Red Bridge approach was at East Street in Washington (West Sacramento). This bridge was removed as soon as traffic was routed over the new and present structure built in 1911.

West Sacramento: The first settlers came to the area during the early 1840's. In 1849, the area was surveyed and divided into township parcels that became known as Washington. Washington was primarily dedicated to agriculture although, in addition to agriculture, from 1864 to 1866 the Pacific Coast salmon cannery was present along the West Sacramento River walk. In 1914, the township was renamed Broderick.

Sacramento: During the mid-1800s the project area was developed as a locomotive maintenance and rebuilding facility, among other functions. During the mid-1800s the area north of the Railyards was primarily undeveloped due to the swampy characteristic of the area, and the presence of the American River channel which extended through the project limits. Sutter Lake existed immediately south and east of the project and a promontory from Sutter Lake to the American River, named Slater's Addition was shown to exist in 1848. This promontory was crisscrossed by a number of streets (Sycamore, First, Broad, Lake) that no longer exist. Many ships anchored off Slater's Addition giving rise to the name of Jibboom Street for its waterfront area. This area did not develop as rapidly as the central business district between I and M Streets or the Standard Pacific Railroad (SPRR) which developed along Sutter Lake. In 1868, to prevent flooding, the American River was rechanneled to its present day configuration. By 1910, Sutter Lake had been filled and the Railyard was further developed which led to the development of the area to the north.

2.6.1 Aerial Photograph Review

The following aerial photos were reviewed:

1854 Photo Map Overlain on 1937 Aerial, Scale unavailable
1937 Photo by Laval, Scale 1"=500'
1947 Photo by USGS, Scale 1"=500'
1957 Photo by Cartwright, Scale 1'=500'
1964 Photo by Cartwright, Scale 1"=500'
1971 Photo by Cartwright, Scale 1"=500'
1984 Photo by USGS, Scale 1"=500'
1993 Photo by USGS, Scale 1"=500'
1998 Photo by EDR, Scale 1"=500'

2005 Photo by EDR, Scale 1"=500'
2006 Photo by EDR, Scale 1"=500'
2009 Photo by EDR, Scale 1"=500'
2010 Photo by EDR, Scale 1"=500'
2012 Photo by EDR, Scale 1"=500'

We reviewed historic aerial photography to identify conditions that may indicate potential hazardous materials conditions within or adjacent to the project limits. Aerial photographs are provided in Appendix A. The following summary highlights these findings.

West Sacramento

1937: The I Street Bridge approach (railroad and automobile) is located along D Street with the main approach connecting to 3rd Street. C Street is developed with multiple structures interspersed with trees. The block north of C Street between 3rd and 4th Streets is primarily vegetation with one large building in the center of the parcel. The Firehouse block, south of C Street, is developed with multiple structures between 2nd and 3rd Streets. The area between the river and 2nd Street is developed with multiple cabin-like structures. Three service stations are present at the intersection of 5th and C Streets. The parcel at the southwest corner of C and 3rd Streets is developed with what appears to be a service station.

1947: Additional structures are located along the C Street corridor. The vegetated parcel is cleared and now has multiple large structures present.

1957: No significant changes.

1964: The automobile approach to I Street Bridge has been realigned to C Street along an inverted S-curve to D Street between 3rd and 2nd Streets. The east half of the block where the new bridge approach was constructed has been cleared. Very little vegetation remains.

1971: No significant changes.

1984: Poor photography resolution.

1993: The cabin structures adjacent to the river are no longer visible. A large water tank north of B Street is visible. The service station at the southwest corner of C and 3rd Streets is gone.

1998: Two large structures are no longer visible at the Firehouse block. The block between 3rd and 4th Streets north of C Street is cleared. The site at the southeast corner of C and 5th Streets is cleared. The southwest quadrant of the block between 2nd and 3rd Streets, north of C Street, is cleared; this parcel historically housed two laundry facilities.

2005: Multiple structures are visible in the previously cleared parcel north of C Street between 3rd and 4th Streets. An additional structure is cleared from the Firehouse block.

2006: No significant changes.

2009: Additional development within the project limits.

2010: No significant changes.

2012: No significant changes.

Sacramento

1854: A map (1854) of the American River is overlain on a 1937 Aerial Photograph. The former river channel of the American River is identified. The former confluence of the Sacramento and American Rivers is located along the north side of the Railyards immediately south of the existing water treatment plant.

1937: The Jibboom Street alignment connects to the present day Bercut Drive in an arcing ninety degree bend. A water treatment facility exists east of Bercut Drive (original Jibboom Street alignment). Multiple railroad tracks and switch tracks are present. One structure is visible west of Jibboom Street just north of where the new bridge alignment is located. A second large structure is located where the proposed Bercut intersection is planned. A large warehouse/dock area is located south of the proposed bridge approach on the riverbank west of Jibboom Street. A faint outline of the promontory that used to extend into the Sacramento River is visible. The American River is in its present day alignment.

1947: Multiple structures associated with the Railyards are south of the curve connecting Jibboom Street and Bercut Drive. The original Jibboom Street alignment (now Bercut Drive) is visible. Multiple structures are located between the river and Jibboom Street.

1957: A large structure is located immediately north of the large curve connecting Jibboom and Bercut (approximately ¼ mile north of the project alignment). The area surrounding the structure appears to be a junk yard which extends from Bercut on the east and the river on the west.

1964: The junkyard has a large quantity of materials/debris located on site.

1971: I-5 exists in its current alignment. Bercut Drive is terminated south of the water treatment facility. Jibboom is realigned in its present alignment. The junkyard is cleared. All of the structures west of Jibboom are no longer visible with the exception of one structure at the river's edge. The Railyard appears active with some operations extending under the elevated I-5 roadway.

1984: Poor photography resolution.

1993: Portions of the Railyard are cleared.

1998: Additional clearing in the Railyard. Several large buildings remain within the project limits.

2005: The new water intake for the water treatment facility is visible northwest of the project limits. The Railyard is cleared within the project limits with the exception of the railroad tracks.

2006: The Railyard is cleared further and appears to have stockpiles located throughout the northern portion of the site. The railroad tracks are removed.

2009: The stockpiles are no longer visible.

2010: The precursor to Railyard Boulevard is visible.

2012: No significant changes.

2.6.2 Topographic Map Review

Topographic maps reviewed include 7 ½ -minute quad maps from 1916, 1949, 1954, 1967, 1975, 1980 and 1992; and a 15-minute quad map from 1907. Copies of topographic maps are provided in Appendix B. This summary includes the noted changes within and adjacent to the project limits as recorded on the maps:

West Sacramento

1907: West Sacramento is identified as Washington/Broderick. A levee exists adjacent to the Sacramento River. Structures are present on both sides of the levee. The Southern Pacific railroad alignment along D Street ends at 5th Street in a spur line. The railroad track jogs southeast from D Street to E Street and continues to a bridge crossing. The bridge crossing is identified as a railroad crossing. The bridge crosses the Sacramento River extending from the approach at E Street to the Sacramento Railyards. The I Street Bridge is not present. Multiple structures are visible along the roads (present day C Street and east of 2nd Street) within the project alignment.

1916: A second bridge, the I Street Bridge, extends across the Sacramento River from D Street to the Sacramento Railyard. The existing Tower Bridge is identified as a railroad crossing and is located south of the other two bridges.

1949: The area is identified as Broderick. I Street Bridge is identified by name. The bridge extending from E Street is no longer present. The approach to the I Street Bridge is modified to extend north on 3rd Street between D and C Streets. C Street is modified as Highway 16/24 as it extends west of 5th Street, curving to the southwest until it runs parallel to the railroad tracks. Several large structures exist on the north and south sides of C Street.

1954: Highway 16/24 is an improved road that extends from west of 6th Street, across the Sacramento River and into the Sacramento Railyards. Few structures are included on this map with the exception of one large structure between 3rd and 4th Streets immediately north of C Street. A small lake is present north of the levee access road.

1967: The small lake is no longer visible. A water tower is identified east of 2nd Street. Borrow Pits are located north of the project limits.

1975: Highway 16/24 is an improved road that extends from west of 6th Street, across the Sacramento River and into the Sacramento Railyards. Few structures are included on this map.

1980: The Old Sacramento State Historical Park is identified south of the project limits.

1992: No significant changes.

Sacramento

1907: The project area is developed with a north-south road. Multiple structures exist on both sides of the roadway. Two large structures are at the river's edge immediately south of the proposed bridge approach. Railroad tracks are visible to the north. A wide area of land (promontory) extends into the Sacramento River at the proposed bridge approach. A railroad bridge crossing is identified north of the present day I Street Bridge. The bridge crosses the Sacramento River extending from the approach at E Street to the Sacramento Rail yards. The I Street Bridge is not present.

1916: A second bridge, the I Street Bridge, extends across the Sacramento River from D Street to the Sacramento rail yard. The Tower Bridge is identified as a railroad crossing and is located south of the other two bridges. A railroad spur is identified adjacent to the river and runs from the I Street Bridge to an unimproved Bercut Drive. Railroad tracks are visible running east-west both to the north and south of the project limits.

1949: I Street Bridge is identified by name. The bridge north of I Street Bridge is no longer present. A Water Intake Tower and Filtration Plant are identified. The north-south road is improved as a major roadway. The promontory no longer exists. An unimproved Jibboom Street is present adjacent to where the promontory previously extended into the river. The Railyard is developed with multiple switch tracks and structures.

1954: No significant changes.

1967: Jibboom Street is unimproved. Bercut Drive connects to the north-south roadway. The large buildings adjacent to the river are no longer present. The Filtration Plant is more developed. Additional railroad tracks are visible within the project limits. One large structure is located at the bridge approach. I-5 is present but not identified by name.

1975: Jibboom Street connects to the north-south roadway. Bercut Drive terminates south of the filtration plant.

1980: No significant changes.

1992: A majority of the railroad tracks are no longer present.

2.6.3 Historical Sanborn® Map Review

West Sacramento

EDR provided Sanborn® Maps from 1895, 1915, 1950, 1952, 1957, 1960, 1968 and 1970 for the project and surrounding area. Appendix C contains copies of the Sanborn® Maps. This review summary includes the noted changes within and adjacent to the project area as recorded on the maps:

1895

- A *Four Way Bridge*, *Watchman* building and *Private Stables* are identified directly across the Sacramento River from the *Pioneer Mills Sperry Flour Company*.

1915

- A *Boat Building*, *Steel Water Tank* and multiple *Dwellings* are located along the east side of 2nd Street.
- *Town Hall* is on the southeast corner of 3rd and C Streets.
- *Washington Public School* is along C Street between 3rd and 4th Streets.
- A *Chinese Laundry* is located at 225 3rd Street. An adjacent structure containing a *washer/dryer* symbol is located south of the laundry. A second *laundry* is located at 217/219 3rd Street.
- The approach to the *Sacramento River Bridge* is identified along D Street.

1950

- The *Dwellings* east of 2nd Street and south of C Street are replaced by forty-six *cabins*.
- A *Fire Department* and *Plating Works* are located south of *Town Hall* at the southeast corner of 3rd and C Streets.
- The *washer/dryer* adjacent to the laundry are no longer present.

1952

- The *Town Hall* site is cleared.
- A *Gas & Oil* structure is identified at the southwest corner of 3rd and C Streets.

1957

- A new structure, with an indiscernible label, is located where *Town Hall* was previously located. The *Washington Public School* is now *Yolo County Offices*.
- The *Chinese Laundry* site is cleared.

1960

- The approach to the I Street Bridge is realigned from D Street to C Street, curving south along 2nd Street.

1968

- A *Boat Repair Shop* is located at the northeast corner of 3rd and C Streets. An unidentified building is located east of the *Plating Works*.

1970

- No significant changes.

Sacramento

EDR provided Sanborn® Maps from 1895, 1915, 1950, 1952, 1957, 1960, 1964, 1965, 1966 and 1968 for the project and surrounding area. Appendix C contains copies of the Sanborn® Maps. This review summary includes the noted changes within and adjacent to the project area as recorded on the maps:

1895

- *Pioneer Mills & Grain Wharf* exists west of First Street adjacent to the Sacramento River.
- First Street parallels the Sacramento River until it juts northeast just north of the Railyard and ends at Sycamore. First Street no longer exists, but appears to be the precursor to present day Jibboom Street.
- A *car repair shop* exists on the east side of First Street across from *Pioneer Mills*.
- Sycamore Street is aligned northwest between the *swamp* and the Sacramento River just north of the Railyard.
- A *coal shed* and *coal pile* associated with the rail yard exists south of Sycamore St.
- Multiple *dwellings* are located along First Street and Sycamore St.
- A *swamp* is identified east of the project area north of the Railyard.

1915

- *Pioneer Mills* is now *Ennis-Brown Co. Warehouse*.
- The portion of First Street that juts northeast is renamed Water Street and connects First Street to Sycamore Street.
- The coal shed and coal piles no longer exist.
- A *scrap iron* pile is located east of Sycamore.
- A *pumping station* is located at the south end of the *Ennis-Brown Warehouse*.
- The *PG&E Power Plant Station B* is identified. *Transformers* are identified on the north side of the building.
- *PG&E wharf* is identified on the Sacramento River west of the power plant.
- *Sacramento Lumber Co*. wharf is identified on the Sacramento River north of the PG&E wharf.

1950, 1952

- Ennis-Brown Co. Warehouse is now identified as *Old Pioneer Warehouse Co. U.S. Government Occupancy.*
- First Street is identified as Jibboom Street viaduct.
- Dwellings along Sycamore are gone and are replaced by *Southern Pacific Store Room and Switch Frog Shop*.

- *PG&E Power Plant Station B* exists in its present location. Three 500,000 gallon above ground fuel oil tanks exist to the east of the power plant building.
- *California Zonolite* (vermiculite insulation) Manufacturing exists west of Jibboom Street north of the Ennis-Brown Warehouse. It is not clear if this site extends into the Jibboom Junkyard site.
- *Sacramento City New Municipal Pumping Station & Filtration Plant* exists east of Jibboom Street. The site consists of a *pumping station*, *filters, settling tanks, clarifiers, aeration fields, misting tanks, coagulation tanks, sedimentation basin* and a *Filtered Water Basin* (Underground).

1957

- A new structure labeled *Open Transfers Switch* is located adjacent to the *Store Room*. A *steel water tank* is located east of Jibboom Street and south of the Store Room.

1960

- East of the PG&E wharf a building labeled "*built in 1913*" identifies contents as *metal storage*/*electric motors*. A structure adjacent to the river, west of Jibboom Street (1st Street) is identified as *Storage*.

1964, 1965

- Three 10,000-gallon Above Ground Tanks are removed from PG&E facility. Two structures identified as *Switchman's Shanty* and *Switch Tender* are located at the east landing from the I Street Bridge.

1966

- The *Store Room* is no longer present.

1968

- No significant changes.

2.6.4 Historical City Directory Review

Historical city directories from the City of West Sacramento and City of Sacramento were reviewed to look for evidence of hazardous materials conditions at or near the project corridor. The City Directory review did not identify any conditions that are not already identified in other sections of this report. The City Directory is provided in Appendix D.

2.6.5 Title Document Review

BCI was not provided title documents for this assessment.

3. RECORDS REVIEW

3.1 County, State and Federal Records Review

BCI requested Environmental Data Resources, Inc. (EDR), a commercial data base search firm, to perform a "Radius Map with GeoCheck" search for the project area on April 16, 2015. The search includes a review of county, state, Federal and EDR proprietary databases for sites located within a 1-mile radius from the approximate outline of the project limits. A copy of the EDR Report, including a complete listing, description and acronyms for the databases searched, is provided in Appendix E. Sites with adequate address information are plotted on EDR's site plan "EDR Radius Map with Geocheck". EDR lists sites with inadequate address information as "orphan sites" and does not provide mapped locations. BCI reviewed the complete list of 15 "orphan sites" identified by EDR and determined that none of these sites appear to be located within or adjacent to the project limits. In addition to the EDR Radius Report, we have obtained data regarding hazardous materials contamination on or near the project limits from the following sources:

- State Water Resources Control Board GeoTracker on-line database
- DTSC EnviroStor on-line database
- Yolo County Environmental Health Services (YCEHS)
- Sacramento County Environmental Health Department (SCEHD)

3.2 Summary of Records Search

The following is a summary of sites within the project corridor or considered close enough to the project corridor to potentially impact the project.

3.2.1 West Sacramento –Acquisition Sites with Known/Potential RECS

The following is a summary of sites located in West Sacramento within the project corridor with known and/or potential RECs.

APN 010-102-005: 205 2nd Street (Historical Brownfield Site), Site A on Figure 2a

Plans indicate proposed improvements of the levy road at the west half of the parcel. This parcel is currently developed as a levy and gravel access road. The site is listed in the US Brownfields and FINDS databases. A Brownfields listing indicates the site is included on the US EPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) online database for Brownfields Grantees to electronically submit data directly to the EPA.

Findings: The site contained a *boat building*, *dwelling unit* and *out buildings* as early as 1915 (Sanborn) until sometime after 1970 when the structures were demolished. Since that time, the site has contained a levy that is part of the Sacramento River levee system. The records search indicates a Phase I ESA was conducted, however, BCI could not locate the report and there were no findings reported in the database search. No specific hazardous material issues were identified in the EDR database search; however, historical site development can be an indication

of potential contamination sources such as leach fields, septic tanks, buried heating oil tanks, and pesticide usage.

APN 010-102-010, APN 010-372-003, APN 010-372-002: (Historical development), Site B on Figure 2a

Plans indicate proposed improvements of the levy road at the west half of these parcels. The parcels are currently developed as a levy and gravel access road. The West Sacramento River Walk water tower, slated for relocation, is located on APN 010-102-010.

Findings: The parcels are not listed in a regulatory database, however, Historical Topographic and Sanborn maps from 1915 and 1950 indicate the presence of *dwellings* and *out buildings*. No specific hazardous material issues are identified; however, historical site development can be an indication of potential contamination sources such as leach fields, septic tanks, buried heating oil tanks, and pesticide usage.

The Washington Firehouse: Sites C and D on Figure 2a

The Washington Firehouse is located at 305 to 317 3rd Street. The site consists of three parcels, two owned by the City of West Sacramento Redevelopment Agency and one owned by the City of Sacramento. Both owners have agreed to develop the parcels as one site. The site(s) is an EPA Brownfields Targeted Site and has been assessed under this program (Ecology and Environment, Inc. Washington Firehouse Brownfields Site Investigation, February 2000). The focus of the report was on the potential impact from the adjacent property, Capitol Plating. Migration of contamination across/beneath the property boundary was suspected because surface water runoff from Capitol Plating drains onto the site and discharges into the storm drain at the Firehouse site. The report concludes that activities at Capitol Plating appear to have impacted soil and groundwater beneath the Washington Firehouse property. Nickel and lead in surface and near surface soils exceed remedial goals, and groundwater at the property boundary is impacted with nickel, cadmium and chromium above their respective maximum contaminant levels (MCL). The parcels are discussed individually below:

- APN 010-371-005 and APN 010-371-006: 305 3rd Street (Old Police Building), Site C on Figure 2a

  Proposed ROW acquisition is planned the north edge of these parcels. The parcels are currently improved with a parking lot and are immediately north of the Washington Firehouse structure. The site is listed in the CA HAZNET database.

  Findings: These parcels were originally developed in 1915 as the Town Hall until 1952 when the site was cleared. In 1957, a new structure was identified on the Sanborn map as the Town Police Station. The site structures were razed sometime after 1993.
- APN 010-371-004: 317 3rd Street (Washington Firehouse, "Lehrer vacant lot"), Site D on Figure 2a

  Project improvements do not appear to impact this parcel. The parcel is improved with an old structure that appeared abandoned at the time of the site inspection. The site is listed in the US Brownfields and FINDS databases.

Findings: The property is a former fire station and police station dating back to the 1940s. A 500-gallon gasoline UST was removed from the property in 1987, however the database listing under Lehrer Vacant Lot indicate two 4,000-gallon gasoline USTs were registered at this site. A UST Permanent closure permit was apparently issued but was not found in our records search.

- APN 010-371-008: 320 2nd Street (Firehouse Block A), Site D on Figure 2a

  Findings: This portion of the Firehouse Block is now vacant with asphalt surfacing and concrete pads remaining in place from prior residential use. The property was initially developed in the late 1890's and early 1900s for residential use. The property is bisected by an overhead freeway access structure which was the reason for removal of the residences. Approximately 0.25 acres of the parcel was used as a parking lot for the adjacent Firehouse property. The site is listed in the US Brownfields and FINDS databases.

Existing Caltrans ROW: C Street (vacant lot), Site Y on Figure 2a

This parcel is not identified in the records search, however it is adjacent to the Washington Firehouse, which has documented soil and groundwater contamination.

Findings: ROW acquisition is proposed for the north edge of the parcel. The parcel is bisected by the overhead freeway access/approach to the I Street Bridge. The parcel is vacant with some scattered trees and shrubs.

APN 010-371-003: 319 3rd Street (Capitol Plating, Stockton Plating), Site E on Figure 2a

A future connection to 2nd Street is identified through the southern and central portion of this parcel. This site is listed in the UST, CA SLIC, HIST UST, CA ENVIROSTOR, CA RESPONSE, EDR Hist Auto Station databases. The site is currently being investigated by the DTSC under the US Brownfields grant program.

Findings: The site is a former metal-plating business, and has no structures on it, other than the remnants of the cinder block retaining wall that was constructed around the plating area. Approximately eighty percent of the site is covered with either concrete or asphalt. The site originally contained one warehouse structure; however, most of the building was destroyed by fire in 1985.

Prior to operation as a plating facility, the parcel reportedly had been developed for residential use (1936-1938) and as a bus/automobile repair facility (1947). The site was operated as an electroplating (chrome-plating) operation under several owners from 1949 until 1985. Stockton Plating, Inc. purchased the assets of Capitol Plating in 1972 and did business as Capitol Plating until plating operations ceased in 1985 when a fire destroyed the storage bay area.

Environmental concerns were identified at the site in May 1986 when elevated concentrations of chromium, copper, nickel, lead and zinc were encountered in soil samples collected from the site. Since then, several field sampling events have been conducted, including the collection of soil samples, groundwater grab samples, and soil gas samples, and the

installation and sampling of five groundwater monitoring wells on site and four monitoring wells off site. Investigation results are found in the Site Summary Investigation (SSI) Report (URS, 2004) located on the EnviroStor website. The SSI determined that soil and groundwater data indicate elevated levels of chromium, nickel and lead in the soil. Impacted soil extends off site to the east and south. Shallow groundwater also is impacted with chromium, hexavalent chromium, nickel, copper and 1, 2-DCA and extends off site (minimally) in all directions but primarily to the south and east. In general, soil within the upper 10 feet contain concentrations above their Preliminary Remediation Goals (PRGs). The maximum planned remediation depth necessary to remove soil above the PRGs is assumed to be at 12 feet bgs. The site is acceptable for current land use, however, during development, further assessment may be required.

APN 010-371-002: 325 3rd Street, Site F on Figure 2a

This parcel is not identified in the records search, however it is adjacent to the historical Capitol Plating site, which has documented soil and groundwater contamination.

Findings: The property is developed with a gravel driveway and one metal shed-type building which was apparently used in conjunction with the adjacent Capitol Plating property. The property is fenced and gated. Project improvements do not appear to impact this parcel.

APN 010-482-011: 301 C Street and 300 3rd Street (Doris Service Station, E&B Auto Sales, Steven's Service, Marsh, Silva Service Station), Site G on Figure 2a

ROW acquisition is proposed for the north edge of the parcel. The parcel is currently vacant and the ground cleared. This site is listed in the EDR US Historical Auto Station database.

Findings: The site is identified as a service station in 1928, 1966, and 1975 in the Historical Auto Station database. The site is also identified as "*gas and oil*" on Sanborn maps from 1950-1970. No additional information was located.

APN 010-101-004: 217/219 3rd Street, Site H on Figure 2a

Plans indicate "possible removal of residence" at this parcel. The site is currently developed as a residence. The site is listed in the EDR Historical Cleaners database.

Findings: The EDR Historical Cleaners database identified a laundry at 223 3rd Street (Sung Lee) in 1923, and Sanborn maps from 1915 identify two laundry facilities at 225 and 217 3rd Street. The 1915 Sanborn map identifies a *washer/dryer* at the 225 3rd Street site. On the 1950 Sanborn map, the *laundry* at 217 has become a *dwelling* and the laundry at 225 is an unidentified structure. The parcel at 225 3rd Street is cleared/undeveloped in 1957.

APN 010-495-014: 424 C Street & 624 5th Street (Martinez Gulf, Parrish Gasoline, Bob's Towing), Site I on Figure 2a

Minor roadway improvements (overlay/resurfacing) are planned for the south edge of the parcel. The parcel is currently developed as what appears to be the original garage structure and parking lot. This site is listed in the EDR US Historical Auto Station and CA HAZNET databases.

Findings: The EDR US Historical Auto Station database identifies the site as a service station in 1966, operating under a variety of names. One 8,000-gallon gasoline, one 10,000-gallon gasoline, one 5,000-gallon gasoline, and one 550-gallon waste oil UST were registered at this site. In 1987, under YCEHS supervision, the four USTs were removed and the inspection report indicated the tanks were tight and there were no odors or visible contamination noted. No additional information was located.

APN 010-481-001: 427 C Street (Gary's Mohawk Service Station, Elmer's Service, and Broderick Auto Service), Site J on Figure 2a

Partial site acquisition is proposed along the north edge of the parcel for minor improvements (overlay/resurfacing). The parcel is currently a vacant lot being used as a community garden. The site is listed in the CA LUST, CA US HIST CORTESE, and HIST UST databases.

Findings: The property was developed as an automobile service station from 1953 until 1990. Three 1,000-gallon gasoline USTs were removed from the facility in August 1990 under YCEHS supervision. Soil samples obtained from beneath the locations of the former tanks contained detectable concentrations of petroleum hydrocarbons. Subsequent excavation of contaminated soil and sampling at the excavation limits in October 1990 indicated the bulk of contaminated soil was removed. Although low concentrations were detected in soil samples obtained from 19 feet bgs, YCEHS authorized backfilling of the former tank pits even after the tank removal firm disclosed historical groundwater levels were shallower than the remaining subsurface soil contaminants. Soil contamination below groundwater levels indicate the possibility that groundwater beneath the subject property may also be impacted.

During tank removal and subsequent excavations, approximately 200 cubic yards of soil was excavated. In 1991, laboratory reports indicate the stockpiled soil was non-hazardous. Based on YCEHS files, it appears that approximately six cubic yards of stockpiled soil was removed off site for disposal. There is no record of how the remaining 194 cubic yards of soil was disposed although records note that it may have been spread onsite.

The City of West Sacramento purchased the property in 1994 and conducted additional soil and groundwater assessments. Soil and groundwater investigations from 1993 through 2010 indicated a potential direct contact risk to residential site use from TPH-mo, cadmium and lead in shallow soil (1-5 feet bgs). The shallow soil contamination is assumed to be due to poor housekeeping issues from the numerous site businesses. Soil was excavated and the excavation backfilled with "clean" backfill material, in order to remove this potential threat to human health. Subsequent sampling indicated the risk to human health had been remediated. Ninyo and Moore (2011), environmental consultants for the City of West Sacramento, reported that groundwater data indicated low concentrations of TPH at one monitoring well, however TPH concentrations

appear to be attenuating under natural conditions, and do not represent a threat to water quality or human health. In July 2012, all four groundwater monitoring wells were destroyed. A NFA letter was issued by RWQCB in August 2012.

APN 010-193-005: 521 C Street and 519 C Street (Golden Eagle Garage), Site K on Figure 2a

Minor improvements are planned for the north east edge of the parcel. The site is partially occupied by a residence and the Golden Eagle Garage building and "decorative" gas pumps. The site is listed in the EDR US Historical Auto Station database and CA UST database.

Findings: The site is identified as a gasoline and oil service station in 1942 and appears in the listing under several names until 1982. The Golden Eagle Garage is identified in the CA UST database. One 750-gallon gasoline, one 500-gallon gasoline, and one 250-gallon gasoline UST were registered at this site. An "Application for Permit to Abandon USTs" was submitted in July 1987 for the removal of the three USTs. The inspection report indicated two steel tanks (one 550-gallon and one 750-gallon) were removed and both USTs were tight and soil clean. The 250-gallon UST is not discussed. The site diagram is not legible due to poor Xerox quality. No closure letter for this facility was located during our review.

APN 101-494-017: 500 C Street (Former Hudson Oil Station, Cole's Shell Service Station, On the Ball Graphics), Site L on Figure 2a

Minor roadway improvements/partial site acquisition is proposed at the southeast corner of the parcel. The site is currently developed as a market and deli and associated parking lot. The site is listed in the CA HIST CORTESE, HIST UST, CA RGA LUST, EDR US Historical Auto Stations and LUST databases.

Findings: This site was developed as a service station since 1966 and has operated under a variety of names. Two 12,000-gallon gasoline, one 8,000-gallon (type unknown), and one 550-gallon waste oil USTs were registered at this site. The USTs were located at the east edge of the parcel. During tank removal in 1987, soil contamination and odors were detected. Laboratory results indicated gasoline range petroleum hydrocarbons and elevated levels of BTEX were present. Upon YCEHS written authorization, the soil was stockpiled, aerated and placed back into the excavation area. A NFA letter was issued in 1987 by YCEHS.

3.2.2 West Sacramento - Adjacent Sites with Known and/or Potential RECS

Roadway improvement plans for this parcel do not indicate any acquisition will occur, however, the site is located adjacent to the project alignment and was reviewed for RECs.

APN 010-560-037: 310 B Street (West Sacramento Lighthouse Pump Station)

It does not appear that improvements will impact this parcel. The parcel is improved with a pump house structure. This site is listed in the UST database.

Findings: One 2,000-gallon diesel UST was registered at this site. The UST was removed in May 2005 by Ramcon Engineering under YCEHS supervision. Soil and groundwater sampling beneath

the tank slab was conducted and were analyzed for diesel, gasoline, BTEX and the five common oxygenates. None of the compounds were detected in either soil samples or groundwater sample above laboratory detection limits. A NFA finding was determined by the county. The records do not indicate suspected soil and/or groundwater contamination.

3.2.3 Sacramento –Acquisition Sites with Known/Potential RECS

The following is a summary of sites located in Sacramento within the project corridor with known and/or potential RECs.

Sacramento Railyards: Figure 2b and 2c

The Sacramento Railyards (Railyards) consist of approximately 240 acres historically developed as a locomotive maintenance and rebuilding facility from the 1860s to the early 1990s. Previous operations at the site resulted in underlying soil and groundwater impacts. In 1988 Southern Pacific Transportation Company (SPTCo) entered into the 1988 Enforceable Agreement with DTSC, which addresses environmental impacts. Union Pacific railroad company (UPRR) entered into a merger with SPTCo in 1996 and acquired the Railyards in 1998. Pursuant to the 1988 Enforceable Agreement, UPRR has investigated and remediated soil and groundwater contamination at the Railyards. In addition, UPRR has certain continuing obligations under the 1988 Enforceable Agreement, including remediation of groundwater, soil vapor, and ongoing operation and maintenance responsibilities. DTSC acts as the lead agency for the cleanup efforts.

The Railyards has been divided into study areas to facilitate investigation and remediation of soil and groundwater. The study areas were identified based on past operations and impacted media. The soil study areas include:

- Lagoon
- Central Shops
- Central Corridor
- Car Shop Nine
- Lagoon Northwest Corner
- Northern Shops
- Sacramento Station

The groundwater study areas include the Lagoon Groundwater (LGWSA) and South Plume (SP). Because of the unique constituents of concern and need for additional investigation of the soil and groundwater conditions, a new study area, Manufactured Gas Plant (MGP) Study Area, was created.

Soil in the Lagoon, Northern Shops, Central Corridor, Car Shop Nine and portions of Sacramento Station have been remediated under their respective RAPS, and certified under DTSC oversight. A LUC was issued in 2015 for these study areas, and DTSC concluded that these areas, as remediated and when used in compliance with the Environmental Restrictions of

the LUC, do not present an unacceptable risk to present and future human health or safety or the environment. The LUC outlines approved land use and provisions for soil, soil vapor and groundwater management.

Provisions of the LUC include, in part:

1. No activities that will disturb the soil shall be allowed on the Property without a soil management plan (SMP) approved in writing by the DTSC
2. Any soil brought to the surface shall be managed in compliance with all applicable provisions of state and federal law and a SMP approved in writing by DTSC
3. No extraction of groundwater except as approved in advance in writing by DTSC in a GMP
4. Vapor intrusion mitigation management is required for enclosed structures or buildings.

Groundwater and soil vapor impacts beneath the property are in the process of being remediated by and are the continuing obligation of UPRR, and contamination in these media will be addressed by the final remedies in the RAPs for the Central Shops soil, South Plume groundwater, future Lagoon Groundwater, and the future MGP soil and groundwater study areas.

Groundwater monitoring wells, groundwater and soil vapor extraction wells, and related groundwater and soil vapor extraction remediation systems (collectively called "Remediation Systems") have been and may continue to be installed as part of remediation in the South Plume and Lagoon Groundwater study areas, and the MGP soil and groundwater study area. Groundwater contamination associated with the South Plume and Lagoon Groundwater has been identified as containing, but not limited to DCA, 1, 2-dichloroethene (DCE), tetrachloroethene (PCE), trichloroethylene (TCE), and vinyl chloride.

The project is located in part, within and/or adjacent to the Northern Shops, MGP and Sacramento Station study areas which are discussed below.

- Northern Shops Study Area (NSA): The new bridge approach is proposed to connect with Railyards Boulevard in the NSA. Site M on Figure 2b

  Findings: Soils in the NSA were investigated and remediated under the RAP for the Northern Shops approved by DTSC in 2000. Additional soil removal for previously inaccessible soil was completed in 2012-2013 when the Mainline Track and Track 150 were removed. During removal of contaminated soil below Track 150, a UST, boilers, pipelines, and bunker fuel were found and removed. Soil contaminated with bunker fuel was excavated to the water table.

  Soil in the NSA is certified and there are no requirements for additional soil investigations, however, all work in this area must comply with the 2015 LUC, Railyards Projects – Soil & Groundwater Management Plan (2015), and property owner approvals and agreements.

Additional characterization and groundwater remediation for this area will be addressed as part of the LGWSA remedy. The 2015 LUC requires that vapor mitigation measures approved by DTSC be implemented for any enclosed structures or buildings.

- Manufactured Gas Plant (MGP) Study Area: The project limits extend through the MGP site boundaries. Site N on Figure 2b and 2c

  Findings: The former MGP area is located in the western portion of the Railyards and includes areas within the Sacramento River levee located between the Railyards and the Sacramento River. The MGP was identified in 2003 during excavation of impacted soil associated with the NSA. A Final RIR was prepared to characterize the occurrence of potentially hazardous substances. Soil, soil vapor and groundwater at the MGP area are impacted. Soil contamination includes metals, TPH, VOCs and SVOCs. Groundwater (in both sand and gravel zones) chemicals of concern include TPH, VOCs, SVOCs and metals. The study also identified VOCs and SVOCs in the soil vapor. This is currently an open case with DTSC as lead agency.

- Sacramento Station Study Area (SSA): The removal and/or demolition of existing bridge approach and viaduct structures are to occur within this study area. Site X on Figure 2c.

  Findings: The Sacramento Station was used as a wheel foundry and depot. The soil was contaminated with metals and TPH. Groundwater contamination includes metals, SVOCs and TPH. The soil remedy for the SSA was selected in 1989. Soil removal was completed in the early 1990s and an LUC was recorded in 1994. The SSA is certified as having its remedy complete. The property is restricted to use as prescribed in the LUC and Railyards Soil and Groundwater Management Plan.

APN 001-0190-017, APN 001-0210-018, and APN 002-0010-023: These parcels are located east of the Sacramento River and West of Jibboom Street. Sites O, P, and Q on Figure 2b

Findings: ROW acquisition is proposed for these three parcels located along the west side of Jibboom Street. The sites are not listed in the searched databases, however, the area has been adjacent to industrial operations at the Railyards and Associated Metals/Jibboom Junk Yard. A portion of the existing levee, although not within the Railyards, was remediated as part of the Railyards clean-up. This area is identified as the "Levee Excavation" (located west of NSA area, adjacent to bike path). In 2008, a small portion of the levee was excavated due to visible impacts (black staining and strong odor) found during excavation of the Lagoon-13 site. Approximately 4,200 cubic yards of soil contaminated with metals and petroleum hydrocarbons were removed from the levee. Confirmation samples were below remedial goals. Remediation of the levee excavation is complete at this location.

APN 006-0011-006 and -009: 111 I Street (CA State Railroad Museum), Site U on Figure 2c

Removal of the existing bridge access structures/ramp is proposed for the area immediately north (adjacent) to and above this parcel. The site is listed in the Sacramento County MLS database. It does not appear that project improvements will impact this parcel.

APN 002-010-027: 904 2nd Street (Historical Cleaners), Site V on Figure 2c

Removal of the existing bridge access structures/ramp is proposed for the area immediately north (adjacent) of this parcel. The site is listed in the Historical Cleaners database in 1923, 1933, 1937, 1942 and 1956. It does not appear that project improvements will impact this parcel.

3.2.4 Sacramento - Adjacent Sites with Known and/or Potential RECS

Roadway improvement plans for these parcels do not indicate any acquisition will occur, however, these sites are located adjacent to the project alignment and were reviewed for RECs.

Sacramento Filtration Plant/City of Sacramento, 101 Bercut Drive, Figure 2b

This site is listed in the following databases: RCRA-SQG, FINDS, HAZNET, CHMIRS, AST, HIST UST, Sacramento Co. ML.

Findings: Two registered USTs, both 750 gallon gasoline tanks were previously located at this site. The site currently maintains one 6,000 gallon above ground fuel storage tank. Contaminated soils from site clean-up, asbestos containing materials and radioactive water waste removal occurred in 2002. Date of completion is not reported.

Associated Metals (Jibboom Street Junkyard), 230-260 Jibboom Street, Site S on Figure 2b

This site is listed in the following databases: CERCLIS, RCRA-SQG, FINDS, CONSENT, Delisted NPL, ROD, US ENG CONTROLS, ENVIROSTOR, HIST Cal-Sites, HAZNET, SLIC, DEED, VCP, and Sacramento Co. ML.

Findings: The site encompasses approximately nine acres although the original size of the site is unknown and may once have covered approximately 35 acres. The nine acre site is the former location of the Associated Metals Company salvage yard. Of the original 9-acre Associated Metals property, approximately 6.7 acres is covered by I-5 and the adjacent, present day Jibboom Street. The remaining 2.3 acres of the former Associated Metals property is a relatively flat open field which has been converted into Jibboom Street Park. Approximately 8-10 feet of clean soil has been added to raise the park to the elevation of the levee.

Hazardous material issues were discovered on this site in 1981. The site was identified as being contaminated with copper, lead, PCBs, and zinc. The Jibboom Junkyard was a National Priority List (NPL) site, but was removed from the database in 1991. Review of the NPL records indicate that the site was closed by the EPA in 1991, due to the fact that all cleanup goals specified by the federal EPA had been met, institutional controls were in place and all required reports and records were completed. Because the site was considered available for unrestricted access and use after completion, a five-year review was not required. However, EPA Region IX elected to complete a discretionary Five-Year Review after the City of Sacramento approved preliminary development plans that could change land-use in the vicinity to residential.

The current alignment of Jibboom Street and I-5 are within the original footprint of the historic Associated Metals Yard. The historic property line of the site extended east under the current alignment of Jibboom Street, I-5 and Bercut Drive. Previous investigation of this site did not extend east under Jibboom Street and beyond. EPA Region IX contends that there is a potential for contamination within the historic junkyard boundaries. In addition, EPA recommends (in the Five Year Review Report for Associated Metals/Jibboom Junkyard) "CalTrans document a management procedure to notify workers that this section of ROW was a Superfund site, with some potential for encountering subsurface contamination". This statement refers to existing Jibboom Street, I-5, and Bercut Drive east of the area formally included in the Associated Metals clean-up which did not investigate or remediate the entire junkyard site.

4. PRIOR ENVIRONMENTAL REPORT REVIEW

BCI reviewed the following reports that were previously prepared for areas that include the project limits. Reports, with the exception of BCI reports, are located on the EnviroStor Database website (http://www.envirostor.dtsc.ca.gov) or via BCI upon request. Our review of these reports support and provide documentation for the findings and discussion presented in this report.

- BCI, "Initial Site Assessment Richards to Railyards Access Improvement Project" dated October 2008
- BCI, "Updated Initial Site Assessment for the I-5/Richards Boulevard Interchange (Ultimate) Project" dated July 2010
- DTSC, "Approval of 2012-2014 Soil Remediation Activities (Mainline Track and Track 150) dated June 2012
- ERM, Final Central Corridor, Car Shop Nine, and Northern Shops Remedial Action Plan for Soil, Former SPTCo Sacramento Railyard, approved February 2000
- ERM, Final Remedial Design and Implementation Plan, 2004, Soil Remediation Activities, Sacramento Railyard, dated July 2004
- ERM, Year 2007-2008 Soil Remediation Summary Report, The Railyards, dated June 2009
- ERM, "2012 Soil Remediation Activities Summary Letter" to DTSC, Northern Shops, Central Corridor, Car Shop Nine, and Lagoon Study Areas, Railyard**s**
- ERM, "2012-2013 Soil Remediation Summary Report for Car Shop Nine, Central Corridor, Lagoon and Northern Shops Study Areas (July 2014)
- ERM, "Remedial Investigation Report –Former Manufactured Gas Plant Study Area" dated April 2015
- DTSC, "Land Use Covenant and Agreement - Environmental Restrictions for Specified Study Areas within the Sacramento Railyards" dated September 2015

5. RECONNAISSANCE, SITE INSPECTION AND OWNER INTERVIEWS

The purpose of a visual survey is to collect evidence of current and/or past use or storage of toxic or hazardous materials, the presence of onsite ponds, landfills, dry wells, waste streams or other disposal units, visible soil contamination, above ground or underground storage tanks, drums, barrels and other storage containers.

BCI conducted a site reconnaissance on December 3, 2014 which included a visual survey of the project area and surrounding sites. A second site reconnaissance was conducted on June 1, 2015. The site reconnaissance was conducted from public roads due to private property access restrictions. On-site inspections of building interiors and other structures, therefore, could not be completed during this visual survey. Consequently, potential RECs such as stained soils, hazardous materials storage areas, enclosed above ground tanks, or underground storage tanks may not have been observed and, therefore, could not be addressed in the scope of this ISA.

Photos from our site visit are included in Appendix F. Our observations generally support the land use descriptions and background data discussed above.

6. OWNER/OPERATOR INTERVIEW

Per ASTM, past owners, operators, and/or occupants of the subject property who are likely to have material information regarding the potential for contamination at the subject property shall be contacted to the extent that they can be identified and that the information likely to be obtained is not duplicative of information already obtained from other sources.

BCI was not provided owner/tenant contact information for the properties located in West Sacramento and, therefore, did not conduct any interviews. BCI considers this data gap a limit to the assessment, but is unlikely to represent a data failure.

BCI conducted an interview with Ruth Cayabyab of the DTSC regarding the current regulatory status of the Railyard. Ms. Cayabyab provided information on the current and upcoming regulatory actions pertaining to the Railyards and specifically the areas impacted by the proposed project. Specifically she stated in an email dated May 29, 2015:

> "The Railyards is a 240-acre site that has been divided into study areas to facilitate investigation and remediation. The study areas were identified based on past operations and impacted media (soil vs groundwater). The study areas include: Sacramento Station, Northern Shops, Central Corridor, Car Shop Nine, Lagoon, Central Shops, Manufactured Gas Plant, South Plume, and Lagoon Groundwater. The place where I Street Bridge is proposed to connect with Railyards Boulevard is in the Northern Shops.
>
> The soil remedy for Sacramento Station was selected in 1989. Soil removal was completed in the early 1990s. A LUC was recorded in 1994, and the study area was certified as having its remedy complete.

The soil remedy for Northern Shops, Central Corridor, Car Shop Nine, and Lagoon was selected in 2000. Soil removal for accessible soil was completed in 2007-2008. Additional soil removal for previously inaccessible soil was completed in 2012-2013 when the Mainline Track and Track 150 were removed. A LUC is planned to be recorded in 2015. The LUC will include a requirement for a soil and groundwater management plan if either media is disturbed, a requirement for clean fill or a cap over "native soil" (soil cleaned up to the remedial goals), and a requirement for soil vapor mitigation measures.
The soil remedy for Central Shops was selected in 2013. Soil removal is being implemented in 2015. The soil remedy for Manufactured Gas Plant has not yet occurred. The groundwater remedies for South Plume and Lagoon Groundwater are ongoing.

As stated before, the place where I Street Bridge is proposed to connect with Railyards Boulevard is in the Northern Shops. Most of the soil cleanup in Northern Shops was finished in 2007-2008. Soils that were below Track 150 were removed in 2012-2013. During removal of contaminated soil below Track 150, an underground storage tank (UST), boilers, pipelines, and bunker fuel were found and removed. Soil contaminated with bunker fuel was excavated to the water table. Some areas of impacted soil remain but are outside the area of the future bridge. A LUC is planned to be recorded in 2015."

7. FINDINGS AND CONCLUSIONS

This Initial Site Assessment's objective is to:

- Determine whether there may be hazardous materials at or near the project limits at concentrations likely to warrant mitigation pursuant to regulations;
- Identify recognized environmental conditions (RECs) and/or potential RECs at or near the project limits which could affect property acquisition;
- Identify potential site contamination issues.

This assessment identified the following RECs and/or potential RECs that should be considered in planning for improvements.

7.1 West Sacramento –Partial Acquisition Parcels with Known/Potential RECs

The following is a summary of sites located in West Sacramento within the project corridor with known and/or potential RECs.

APN 010-102-005: 205 2nd Street, Site A on Figure 2a

Plans indicate proposed improvements of the levy road at the west half of the parcel. This parcel is currently developed as a levy and gravel access road.

Findings: The site was developed with a variety of structures as early as 1915 (Sanborn) until sometime after 1970 when the structures were demolished. No specific hazardous material issues were identified in the EDR database search; however, historical site development can be

an indication of potential contamination sources such as leach fields, septic tanks, and buried heating oil tanks.

Conclusions: *Although none of the potential RECs were positively identified in this ISA, plans for construction and/or partial acquisition should account for the potential to encounter a leach field, septic tank and/or buried heating oil tanks.*

APN 010-102-010, APN 010-372-003, APN 010-372-002: (Historical development), Site B on Figure 2a

Plans indicate proposed improvements of the levy road at the west half of these parcels and the relocation of the Sacramento River Walk water tower. The parcels are currently developed with the water tower, levy and gravel access road.

Findings: The site was developed with a variety of structures as early as 1915 until sometime after 1970 when the structures were demolished. The Sacramento River Walk water tower is the only remaining structure. No specific hazardous material issues are identified but historical site development can be an indication of potential contamination sources such as leach fields, septic tanks, buried heating oil tanks, and pesticide usage.

Conclusions: *Although none of the potential RECs were positively identified in this ISA, plans for construction and/or partial acquisition should account for the potential to encounter a leach field, septic tank and/or buried heating oil tanks.*

The Washington Firehouse: Sites C and D of Figure 2a

ROW acquisition is proposed for the north edges of Sites C.

The Washington Firehouse sites are an EPA Brownfields Targeted Site and have been assessed under this program. The focus of the report was on the potential impact from the adjacent property, Capitol Plating. Migration of contamination across/beneath the property boundary was suspected because surface water runoff from Capitol Plating drains onto the site and discharges into the storm drain at the site. The report concludes that activities at Capitol Plating appear to have impacted soil and groundwater beneath the Washington Firehouse property. The parcels are discussed individually below:

- APN 010-371-005 and APN 010-371-006: 305 3rd Street (Old Police Building), Site C on Figure 2a, ROW acquisition is proposed for the north edges of the parcels.

  Findings: Known soil and ground water contamination exist at this property. Soil and ground water assessments were completed for the parcel, however the sampling locations were not within the proposed ROW acquisition/improvement area for this project.

  Conclusion: BCI recommends a Phase II assessment within the proposed acquisition area be completed.

- APN 010-371-004: 317 3rd Street (Washington Firehouse, Lehrer vacant lot), Site D on Figure 2a

Findings: The property is a former fire station and police station dating back to the 1940s. A 500-gallon gasoline UST was removed from the property in 1987, however the database listing under a second name "Lehrer Vacant Lot" indicate two 4,000-gallon gasoline USTs were registered at this site.

Conclusion: *BCI understands that improvements at this parcel may not occur as part of this project, however, if project plans change and any construction or site acquisition is planned at this parcel, we recommend further assessment. The additional assessment will include a detailed review of existing environmental records at YCEHS and RWQCB to determine current status of compliance; if additional information is not available, conduct a Phase II assessment within the proposed acquisition area*.

- APN 010-371-008: 320 2nd Street (Firehouse Block), Site D (southeast) on Figure 2a

  Findings: Potential migration of contamination across/beneath the property boundary from Capitol Plating.

  Conclusion: *BCI understands that improvements at this parcel may not occur as part of this project, however, if project plans change and any construction or site acquisition is planned at this parcel, we recommend further assessment. The additional assessment will include a detailed review of existing environmental records at YCEHS and RWQCB to determine current status of compliance; if additional information is not available, conduct a Phase II assessment within the proposed acquisition area.*

Parcel APN 010-371-003: 319 3rd Street (Capitol Plating), Site E on Figure 2a

The Washington Specific Plan identifies a future connection to 2nd Street through the southern and central portion of this parcel.

Findings: Soil is impacted with elevated levels of chromium, nickel and lead. Impacted soil extends off site to the east and south. Shallow groundwater is impacted with chromium, hexavalent chromium, nickel, copper and 1, 2-DCA and extends off site (minimally) in all directions but primarily to the south and east.

Conclusions: *BCI understands that improvements at this parcel may not occur as part of this project, however, if project plans change and any construction or site acquisition is planned at this parcel, we recommend further assessment. The additional assessment will include a detailed review of existing environmental records at YCEHS and the RWQCB to determine current status of compliance; if additional information is not available, conduct a Phase II assessment within the proposed acquisition area.*

Parcel APN 010-371-002: 325 3rd Street, Site F on Figure 2a

This parcel is identified for a future connection as identified in the Washington Specific Plan.

Findings: Potential migration of contamination across/beneath the property boundary from Capitol Plating.

Conclusion: *BCI understands that improvements at this parcel may not occur as part of this project, however, if project plans change and any construction or site acquisition is planned at this*

parcel, we recommend further assessment. The additional assessment will include a detailed review of existing environmental records at YCEHS and RWQCB to determine current status of compliance; if additional information is not available, conduct a Phase II assessment within the proposed acquisition area.

APN 010-482-011: 301 C Street and 300 3rd Street (E&B Auto Sales, Steven's Service, Marsh, Dorris Service Station, Silva Service Station), Site G on Figure 2a

ROW acquisition is proposed for the north edges of the parcel.

Findings: The site is identified as a service station in 1928, 1966, and 1975 in the Historical Auto Station database. The site is also identified as "*gas and oil*" on Sanborn maps from 1950-1970. No additional information was located.

Conclusions: *Due to the limited information available for this site, we recommend a detailed review of existing environmental records at YCEHS and the RWQCB and an owner/tenant interview to determine current status of compliance. If no additional information is available, conduct a Phase II assessment within the proposed acquisition area.*

APN 010-101-004: 217/219 3rd Street, Site H on Figure 2a

Plans indicate "possible removal of residence" at this parcel. The site is currently developed as a residence.

Findings: The EDR Historical Cleaners database identifies a laundry at 223 3rd Street (Sung Lee) in 1923 and Sanborn maps from 1915 identify two *laundry* facilities (at 225 and 217 3rd Street). The 1915 Sanborn map identifies a *washer/dryer* at the 225 3rd Street site. Prior to the 1930s, smaller laundry facilities typically collected garments and sent them to centralized cleaning facilities for treatment/cleaning, due to the high risk of fire from the cleaning solvents utilized before perchloroethylene; however, the presence of the washer/dryer indicate cleaning solvents may have been used on this site. On the 1950 Sanborn map, the *laundry* at 217 has become a dwelling and the *laundry* at 225 is an unidentified structure. The parcel at 225 3rd Street is cleared/undeveloped in 1957 and is not developed until 2002.

Conclusions: *Neither address listed on the Sanborn maps correspond with the database listing, however, the laundry at 217 3rd Street appears to be where the possible removal of the residence is proposed. The laundry at 217 3rd Street did not appear to have a washer/dryer associated with the site. Due to the limited information available for this site, we recommend an owner/tenant interview to determine site history. If additional information is not available, a Phase II assessment may be needed.*

Existing Caltrans ROW: C Street (vacant lot), Site Y on Figure 2a

This parcel is not identified in the records search, however it is adjacent to the Washington Firehouse, which has documented soil and groundwater contamination.

Findings: ROW acquisition is proposed for the north edge of the parcel. Removal of the existing bridge approach at this parcel is to occur.

Conclusion: *Conduct a Phase II assessment for metals within the depth of construction impacts. Metals may potentially originate from historical Capitol Plating operations and/or on-going ADL impacts.*

7.2 West Sacramento - Adjacent Sites with Known and/or Potential RECs

Roadway improvement plans for these parcels do not indicate any acquisition will occur, however, these sites are located adjacent to the project alignment and were reviewed for RECs.

Parcel APN 010-495-014: 424 C Street (624 5th Street) (Martinez Gulf Service, Parrish Gasoline), Site I on Figure 2a

Minor roadway improvements (overlay/resurfacing) are planned for the area adjacent to the south edge of the parcel. The parcel is currently developed as what appears to be the original garage structures and parking lot.

Findings: Four USTs were removed and the inspection report indicated the tanks were tight and there were no odors or visible contamination noted.

Conclusions: *BCI understands that improvements adjacent to this parcel will include only overlay and resurfacing, and no portion of the parcel will be acquired. Based on our records review, site observations, and the location of the former USTs, we don't expect residual, shallow soil or groundwater contamination in the planned construction zone; however, if more extensive construction or site acquisition is planned, we recommend a detailed review of existing environmental records at YCEHS and the RWQCB, a site inspection and an owner/tenant interview to determine current status of compliance. If additional information is not available, a Phase II subsurface investigation may be needed.*

Parcel APN 010-481-001: 427 C Street (Gary's Mohawk Service Station, Elmer's Service, and Broderick Auto Service), Site J on Figure 2a

Minor roadway improvements (overlay/resurfacing) are planned for area adjacent to the north edge of the parcel. The parcel is currently a vacant lot being used as a garden.

Findings: The property was developed as an automobile service station from 1953 until 1990. Three USTs were removed from the facility in August 1990 under YCEHS supervision. Soil samples obtained from beneath the locations of the former tanks contained detectable concentrations of petroleum hydrocarbons. Subsequent excavation of contaminated soil and sampling at the excavation limits in October 1990 indicated the bulk of contaminated soil was removed.

The City of West Sacramento purchased the property in 1994 and conducted additional soil and groundwater assessments. Soil and groundwater investigations from 1993 through 2010 indicated soils were impacted by TPH-mo, cadmium and lead in shallow soil (1-5 feet bgs). Soil was excavated and the excavation backfilled with "clean" backfill material. Subsequent sampling indicated the risk to human health had been remediated. Groundwater data indicated low concentrations of TPH at one monitoring well. TPH concentrations appear to be attenuating

under natural conditions, and do not represent a threat to water quality or human health. In July 2012, all four groundwater monitoring wells were destroyed. A NFA letter was issued by the RWQCB in August 2012.

Conclusions: *BCI understands that improvements adjacent to this parcel will be surficial, including only overlay and resurfacing, and no portion of the parcel will be acquired. For the planned construction conditions, we do not anticipate the need for a further assessment*.

APN 010-193-005: 521 C Street and 519 C Street (Golden Eagle Garage, Parkinson), Site K on Figure 2a

Minor improvements (overlay and surfacing) are planned for the area adjacent to the northeast edge of the parcel. The site is partially occupied by a residence and the Golden Eagle Garage building and "decorative" gas pumps.

Findings: One 750-gallon gasoline, one 500-gallon gasoline, and one 250-gallon gasoline UST were registered at this site. An application for Permit to Abandon USTs was submitted in July 1987 for the removal of the three USTs. The YCEHS inspection report indicated two steel tanks (one 550-gallon and one 750-gallon) were removed and both USTs were "tight and soil clean". The 250-gallon UST is not discussed. The site diagram is not legible due to poor Xerox quality. No closure letter for this facility was encountered during our review.

Conclusions: *BCI understands that improvements adjacent to this parcel will be surficial (i.e. no more than 2 feet below the existing ground surface), and no portion of the parcel will be acquired. For the planned construction conditions, we do not anticipate the need for further assessment. If project plans change and ROW acquisition or project improvements include this parcel, conduct a Phase II assessment within the proposed acquisition/improvement area*.

Parcel APN 101-494-017: 500 C Street (Former Hudson Oil Station, Cole's Shell Service Station, On the Ball Graphics), Site L on Figure 2a

Minor roadway improvements/partial site acquisition is proposed at the southeast corner of the parcel. The site is currently developed as a market and deli and associated parking lot.

Findings: This site was developed as a service station since 1966 and has operated under a variety of names including Hudson Oil, Cole's Shell and On the Ball Graphics. Two 12,000-gallon gasoline, one 8,000-gallon (unknown), and one 550-gallon waste oil USTs were registered at this site. The USTs were located at the east edge of the parcel. During tank removal in 1987, soil contamination and odors were detected. Laboratory results indicated gasoline range petroleum hydrocarbons and elevated levels of BTEX were present. Upon YCEHS written authorization, the soil was stockpiled, aerated and placed back into the excavation area. A NFA letter was issued in 1987 by YCEHS.

Conclusion: *BCI understands that improvements adjacent to this parcel will be surficial (i.e. no more than 2 feet below the existing ground surface) and no portion of the parcel will be acquired. For the planned construction conditions we do not anticipate the need for a further assessment. If project plans change and ROW acquisition or project improvements include this parcel, conduct a Phase II assessment within the proposed acquisition/improvement area*.

7.3 Sacramento – Partial Acquisition Parcels with Known/Potential RECs

The following is a summary of sites located in Sacramento within the project corridor with known and/or potential RECs.

Sacramento Railyards

Previous operations at the site resulted in underlying soil and ground water impacts. In 1988 SPTCo entered into the 1988 Enforceable Agreement addressing environmental impacts. UPRR entered into a merger with SPTCo in 1996 and acquired the Railyards in 1998. Pursuant to the 1988 Enforceable Agreement, UPRR has investigated and remediated soil and groundwater contamination at the Railyards. In addition, UPRR has certain continuing obligations under the 1988 Enforceable Agreement, including remediation of groundwater, soil vapor, and ongoing operation and maintenance responsibilities. DTSC acts as the lead agency for the cleanup efforts.

The Railyards has been divided into study areas to facilitate investigation and remediation of soil and groundwater. The study areas were identified based on past operations and impacted media. The soil study areas include the Lagoon, Central Shops, Central Corridor, Car Shop Nine, Lagoon Northwest Corner, Northern Shops, and Sacramento Station. The groundwater study areas include the LGWSA and SP. Because of the unique constituents of concern and need for additional investigation, a new study area was created for the soil and groundwater conditions in the MGP Study Area.

Soil in the Lagoon, Northern Shops, Central Corridor, Car Shop Nine and portions of Sacramento Station have been remediated under their respective RAPS, and certified under DTSC oversight. A LUC was issued in 2015 for these study areas, and DTSC has concluded that these areas, as remediated and when used in compliance with the Environmental Restrictions of the LUC, do not present an unacceptable risk to present and future human health or safety or the environment. The LUC outlines provisions for soil, soil vapor and groundwater management.

Groundwater and soil vapor impacts beneath the property are in the process of being remediated by and are the continuing obligation of UPRR, and contamination in these media will be addressed by the final remedies of the Central Shops soil and SP RAP and the future LGWSA RAP and the future MGP soil and groundwater study area RAP.

Groundwater monitoring wells, groundwater and soil vapor extraction wells, and related groundwater and soil vapor extraction remediation systems (collectively called “Remediation Systems”) have been and may continue to be installed as part of remediation in the South Plume and Lagoon Groundwater study areas and the MGP soil and groundwater study areas.

The project is located within and/or adjacent to the Northern Shops, Sacramento Station, and Manufactured Gas Plant study areas which are discussed below.

- Northern Shops: The new bridge approach is proposed to connect with Railyards Boulevard in the NSA. Site M on Figure 2b

  Findings: Soils in the NSA were investigated and remediated under the Remediation Action Plan (RAP) for the Northern Shops approved by DTSC in 2000. Soil in the NSA is certified and there are no requirements for additional soil investigations. Additional characterization and groundwater remediation for this area will be addressed as part of the Lagoon Groundwater Study Area remedy.

  Conclusions: *All work must comply with the 2015 LUC, Railyards Projects – Soil & Groundwater Management Plan (2015); and property owner approvals and agreements. Groundwater impacts have not been established by UPRR, therefore a Phase II assessment of groundwater to depth of construction is recommended. All Phase II sampling plans must be approved by DTSC.*

- Manufactured Gas Plant: The project limits extend through the MGP study area boundaries. Site N on Figure 2b and 2c

  Findings: A Final RIR was prepared to characterize the occurrence of potentially hazardous substances. Soil, soil vapor and groundwater at the MGP area are impacted. Soil contamination includes metals, TPH, VOCs and SVOCs. Groundwater (in both sand and gravel zones) chemicals of concern include TPH, VOCs, SVOCs and metals. Project improvements are limited to removal of existing Jibboom Street viaduct.

  Conclusions: If soil remedy is complete and soils are certified prior to construction, comply with resulting LUC and/or guidance documents. If site characterization is not complete, conduct Phase II assessment within the depth and area of construction improvements.

- SSA: The removal and/or demolition of existing bridge approach and viaduct structures are to occur within this study area. Site X on Figure 2c.

  Findings: The soil remedy for the SSA was selected in 1989 and soil removal was completed in the early 1990s. A LUC was recorded in 1994.

  Conclusions: *All work must comply with the 1994 LUC, Railyards Projects – Soil & Groundwater Management Plan (2015); and property owner approvals and agreements.*

APN 001-0190-017, APN 001-0210-018, and APN 002-0010-023: These parcels are located east of the Sacramento River and West of Jibboom Street. Sites O, P, and Q on Figure 2b

Findings: ROW acquisition is proposed for these three parcels. The sites are not listed in the searched databases, however, the area has been adjacent to industrial operations at the Railyards and Associated Metals/Jibboom Junk Yard. A portion of the existing levee, although not within the Railyards, was remediated as part of the Railyards clean-up. This area is called the Levee Excavation (located at the west edge of Northern Shop area, adjacent to bike path). In 2008, a small portion of the levee was excavated due to visible impacts (black staining and strong odor) found during excavation of the Lagoon-13 site. Approximately 4200 cubic yards was removed

from the levee. Confirmation samples were below remedial goals. Remediation of the levee excavation is complete.

Conclusion: *Complete a Phase II subsurface investigation to evaluate the potential for metals, TPH and PCB impacts for all construction activities that will result in soil excavation within the proposed ROW adjacent to Jibboom Street at these parcels. Based on the findings of the Phase II investigation, a soils management plan and health and safety plan may be necessary*

APN 002-010-027: 111 I Street (CA State Railroad Museum), Site U on Figure 2c

Findings: Removal of former bridge access structures/ramp is proposed for the area immediately north (adjacent) of this parcel. The site is listed in the Sacramento County MLS database. It does not appear that this parcel will impact the project.

Conclusion: *No further assessment*.

APN 002-010-027: 904 2nd Street (Historical Cleaners), Site V on Figure 2c

Removal of former bridge access structures/ramp is proposed for the area immediately north (adjacent) of this parcel. The site is listed in the Historical Cleaners database in 1923, 1933, 1937, 1942 and 1956. It does not appear that this parcel will impact the project.

Conclusion: No further assessment.

7.4 Sacramento – Adjacent Sites with Known/Potential RECs

Roadway improvement plans for these parcels do not indicate any acquisition will occur, however, these sites are located adjacent to the project alignment and were reviewed for RECs.

Sacramento Filtration Plant/City of Sacramento, 101 Bercut Drive, Site R on Figure 2b

Findings: Two registered USTs, both 750 gallon gasoline tanks were previously located at this site. The site currently maintains one 6,000 gallon above ground fuel storage tank. Contaminated soils from site clean-up, ACM and radioactive water waste removal occurred in 2002.

Conclusion: *Based on our records review, site observations, and the location of the former USTs, we don't expect residual contamination in the planned construction zone. If more extensive construction or site acquisition is planned, a Phase II assessment may be needed. No additional assessment.*

Associated Metals/Jibboom Street Junkyard**,** 230-260 Jibboom Street, Site S on Figure 2b

Findings: The site encompasses approximately nine acres although the original size of the site is unknown and may once have covered approximately 35 acres. Of the original nine acre Associated Metals property, approximately 6.7 acres is covered by I-5 and the adjacent, present day Jibboom Street. The remaining 2.3 acres of the former Associated

Metals property has been converted into Jibboom Street Park. Approximately 8-10 feet of clean soil has been added to raise the park to the elevation of the levee.

The current alignment of Jibboom Street and I-5 are within the original footprint of the historic Associated Metals Yard. The historic property line of the site extends east under the current alignment of Jibboom Street, I-5 and Bercut Drive. Previous investigation of this site did not extend east under Jibboom Street and beyond. Region IX, USEPA contends that there is a potential for contamination within the historic junkyard boundaries. In addition, EPA recommends (Five Year Review Report for Jibboom Junkyard) "Caltrans document a management procedure to notify workers that this section of ROW was a superfund site, with some potential for encountering subsurface contamination". This statement refers to existing Jibboom Street, I-5, and Bercut Drive east of the area formally included in the Jibboom Street Junkyard clean-up which did not investigate or remediate the entire junkyard site.

Conclusion: *Complete a Phase II assessment to evaluate the potential for metals and PCB impacts for all construction activities that will result in soil excavation within the extent of the former Jibboom Junkyard property. Based on the findings of the Phase II investigation, a soils management plan and health and safety plan may be necessary.*

7.5 General Contamination Issues

Asbestos Containing Materials (ACM) and Lead Based Paint (LBP)

The USEPA NESHAP, 40 CFR Part 61 – Nov 20, 1990, requires an owner or operator of a demolition or renovation project to thoroughly inspect the affected facility or part of the facility where the demolition or renovation operation will occur for the presence of ACM prior to the commencement of that project.

Findings: The I Street Bridge and its associated approaches are proposed for demolition or modification. BCI had the bridge and approaches surveyed for ACM and LCP by Entek, a California Certified Asbestos Consultant and certified Lead Inspector/Assessor. Findings of the surveys are summarized below and the complete Hazardous Materials Survey Final Report (dated 14 May 2015) is in Attachment 1. The report concluded that ACM is present in the railing gaskets and the fastener sealants. Specifics pertaining to individual materials are presented in the attached report.

Entek also investigated existing paints and applied coatings associated with the bridge to determine if lead was present in these materials. Three paints/locations were determined to have paint containing more than 5,000 ppm lead and are classified as lead-based paint: silver paint on metal bridge structure, black paint on metal bridge structure and white paint on metal northeast approach. In addition, the gasket located at the base of the light boxes on the northeast approaches was determined to be pure lead. Precaution should be used when handling this material.

Conclusion: Any demolition or modification of the bridge and/or approach structures within the project area will require that an appropriate ACM and Lead Compliance Plan be developed.

Abatement of LCP and/or ACM shall be conducted, as necessary, by contractors certified to perform such work in accordance with state and federal regulations.

ACM/LCP in Buildings/Residences

The ACM/LCP assessment did not include buildings within the project limits. Typically pre-demolition surveys for occupied buildings are conducted at a later date. Any structure constructed pre-1980 has the potential to contain ACM/LCP materials

Recommendation: *Any structure identified for modification and/or demolition that was constructed pre-1980, must be surveyed by a certified Asbestos Inspector prior to building demolition/modification.*

Aerially Deposited Lead

ADL has been found to occur in soils adjacent to highways and high use roadways. The lead is presumably from the historical use of leaded gasoline and subsequent exhaust emissions. There is potential for encountering ADL during construction and grading activities within the proposed project limits in West Sacramento along C Street, 2nd Street and at the bridge approach/viaduct leading from C Street. A majority of the area adjacent to C Street is covered sidewalk; therefore, an ADL assessment would be limited to areas with exposed soils in that area.

There is potential for encountering ADL during construction and grading activities within the proposed project limits in Sacramento at the bridge approach/viaduct leading from I Street, and along Jibboom Street and Bercut Drive, which have been present in various alignments since 1916 and, therefore, have the potential to be impacted with ADL. BCI conducted an ADL Assessment in 2009 for portions of Jibboom Street north of the current project limits. The 2009 Assessment results indicate that soils from the tested area would be classified as either non-hazardous or as soil acceptable for management in accordance with DTSC and the RWQCB.

In addition, the bridge landing will be located within the Sacramento Railyards. This area is not likely to exhibit elevated concentrations of ADL from typical automobile emissions; however, historical operations at the Railyards has impacted the site with metals including lead. Approved total lead concentrations for soils within the railyards will be guided by the Remediation Goals set for each study area by DTSC.

Recommendation: *Conduct an ADL study within the project limits along C Street, 2nd Street and adjacent to and below the bridge approach/viaduct in West Sacramento; and along Jibboom Street, the new extension of Bercut Drive, and adjacent to and below the bridge approach/viaduct in Sacramento. Within the Railyards property, conduct all operations in compliance with the LUC of 2015, and Railyards Soil and Groundwater Management Plan.*

8. QUALIFICATIONS

Laura Long with BCI prepared this ISA. I declare that, to the best of my professional knowledge and belief, I meet the definition of an environmental professional as defined in Section 312.10 of 40 Code of Federal Regulations (CFR) 312 and have the specific qualifications based on education, training, and experience to assess a property of its nature, history, and setting of the subject property. I have performed all appropriate inquiries in general conformance with the standards and practice set forth in 40 CFR 312.

9. LIMITATIONS

The accompanying report summarizes the findings and opinions of BCI, with regard to the potential for hazardous materials to be present on the properties at concentrations likely to warrant mitigation under current statutes and guidelines. Our findings and opinions are based on information obtained on given dates or provided by specified individuals, through records review, site review, and related activities. Our information is only as good as the information provided to us. Conditions can change after we have made our observations. We cannot warrant or guarantee that hazardous materials do not exist at the described site. To further reduce your risk, invasive exploration may be necessary.

This report was prepared for the specific use of our client and applies only to the subject area. We are not responsible for interpretations by others of data presented in this report.

This report does not represent a legal opinion. No warranty is expressed or implied. We base our conclusions in this report on judgment and experience. We performed this work in accordance with generally accepted standards of practice existing in northern California at the time of the assessment.

The scope of our investigation did not include a determination of the presence of radon. We did not determine the presence of lead-based paint or asbestos-containing materials at all building/structure locations. Identification of endangered species, geologic hazards, or archeological sites are also beyond the scope of this report.

The project involves land and land use with restrictions and prior agreements. The property owner/user should thoroughly review all land use restrictions and requirements and understand the implications to the proposed project improvements.

The governmental records portion of this report is derived from public records and is updated on a continual basis. For this reason, we do not advise you to use this information to base a decision after 180 days of the issue date of this report. Also, conditions at the site can and will change over time. Please contact BCI to revise this report to reflect new information.

10. REFERENCES

BCI, 2009. Aerially Deposited Lead/Phase II Assessment, Railyards to Richards Access Improvements Project

Ecology and Environment, Inc, 2000. Washington Firehouse Brownfields Site Investigation, Sampling and Analysis Report, West Sacramento, California

ERM, 2005. Remedial Investigation Report, Manufactured Gas Plant Study Area Former Southern Pacific Transportation Company, Sacramento, California

ERM, 2010. 2009 Annual Groundwater Monitoring and Remediation System Operation and Maintenance Report, 400 I Street, Sacramento, California

ERM, 2010. Draft Remedial Action Plan for the Central Shops Study Area and South Plume Study Area, Railyards, Sacramento, California

ERM, 2012. Phase IV Remedial Investigation Work Plan for the Manufactured Gas Plant Study Area, Sacramento, California

ERM, 2013. Summary Report for Removal of Underground Storage Tank, Northern Shops Study Area, Sacramento, California

Ninyo and Moore, 2001. No Further Action Required Letter, Former Gary's Mohawk, 427 C Street, West Sacramento, California, (CVRWQCB, 2012), based on Excavation Limits and Confirmation Soil Sample Report

Ramcon, 2005. Underground Diesel Tank Removal and Follow-up Soil and Groundwater Testing, Yolo County Lighthouse Pump Station, 310 B Street, West Sacramento, California

URS, 2004. Former Capitol Plating Site Summary Investigation Report, prepared for DTSC, West Sacramento, California

USEPA Region IX, San Francisco California, 2007. Discretionary Five-Year Review Report for Jibboom Junkyard, Sacramento County, California,

Wagner, et al., 1981, Geologic Map of the Sacramento Quadrangle; State of California, Division of Mines and Geology, Regional Geologic Map Series, Map No 1A (Geology)

Wallace and Kuhl. 1993. Preliminary Site Assessment (PSI), 427 C Street, West Sacramento, California, 1993)

Wallace and Kuhl, 2004. Phase II Site Assessment, 427 C Street, West Sacramento, California

YCEHS Case File, 1991. 500 5th Street, On the Ball Graphics, Former Hudson Gas Station, West Sacramento, California

INITIAL SITE ASSESSMENT

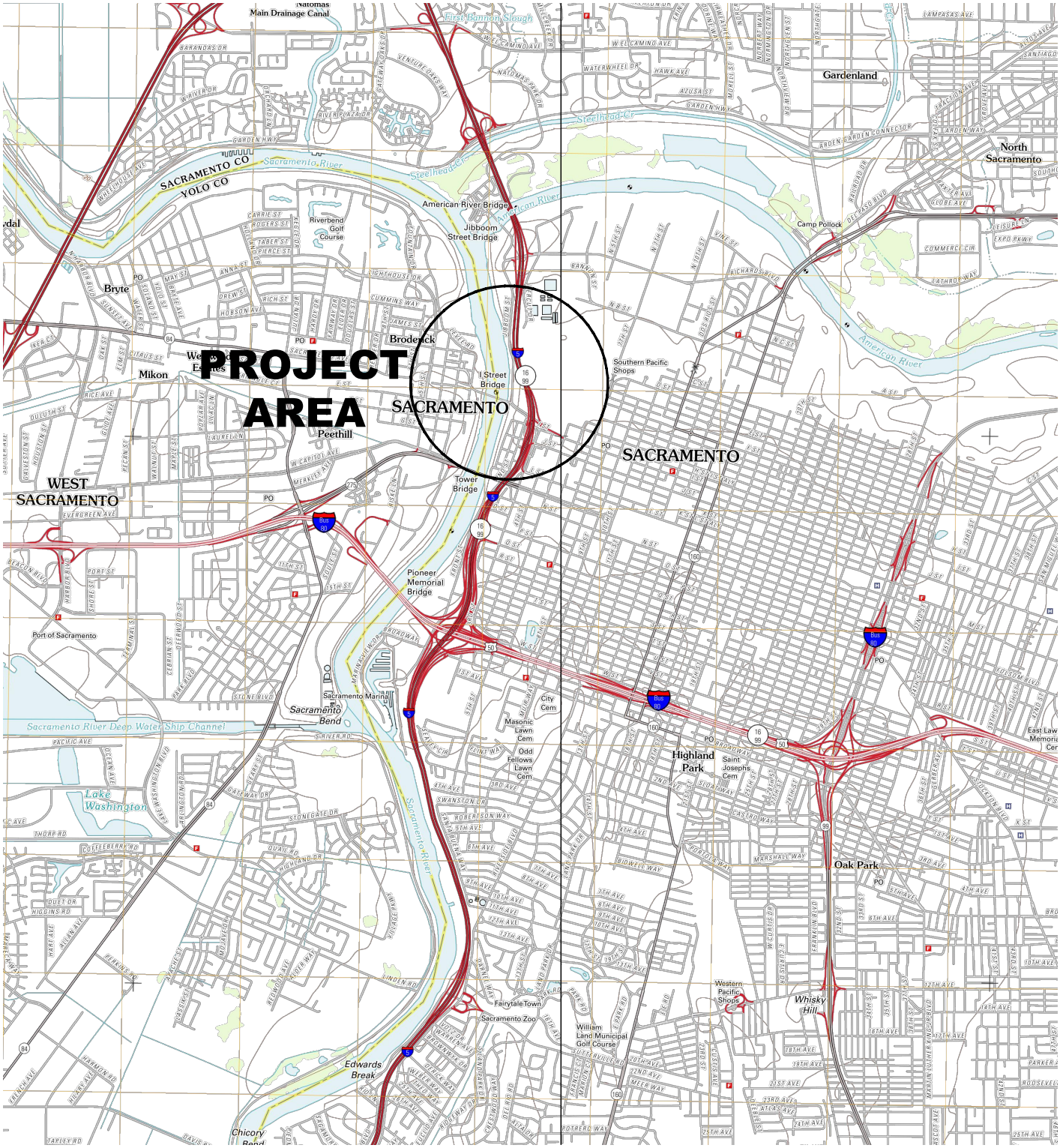
I STREET BRIDGE REPLACEMENT PROJECT

Sacramento, California and
West Sacramento, California

FIGURES

Figure 1 – Vicinity Map

Figure 2a-2c – Site Plan



Source: USGS 7.5 Minute Quadrangles, topographic, 1:24,000. Sacramento East and Sacramento West, dated 2012.

N

SCALE: 1:48,000

blackburn consulting

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VICINITY MAP

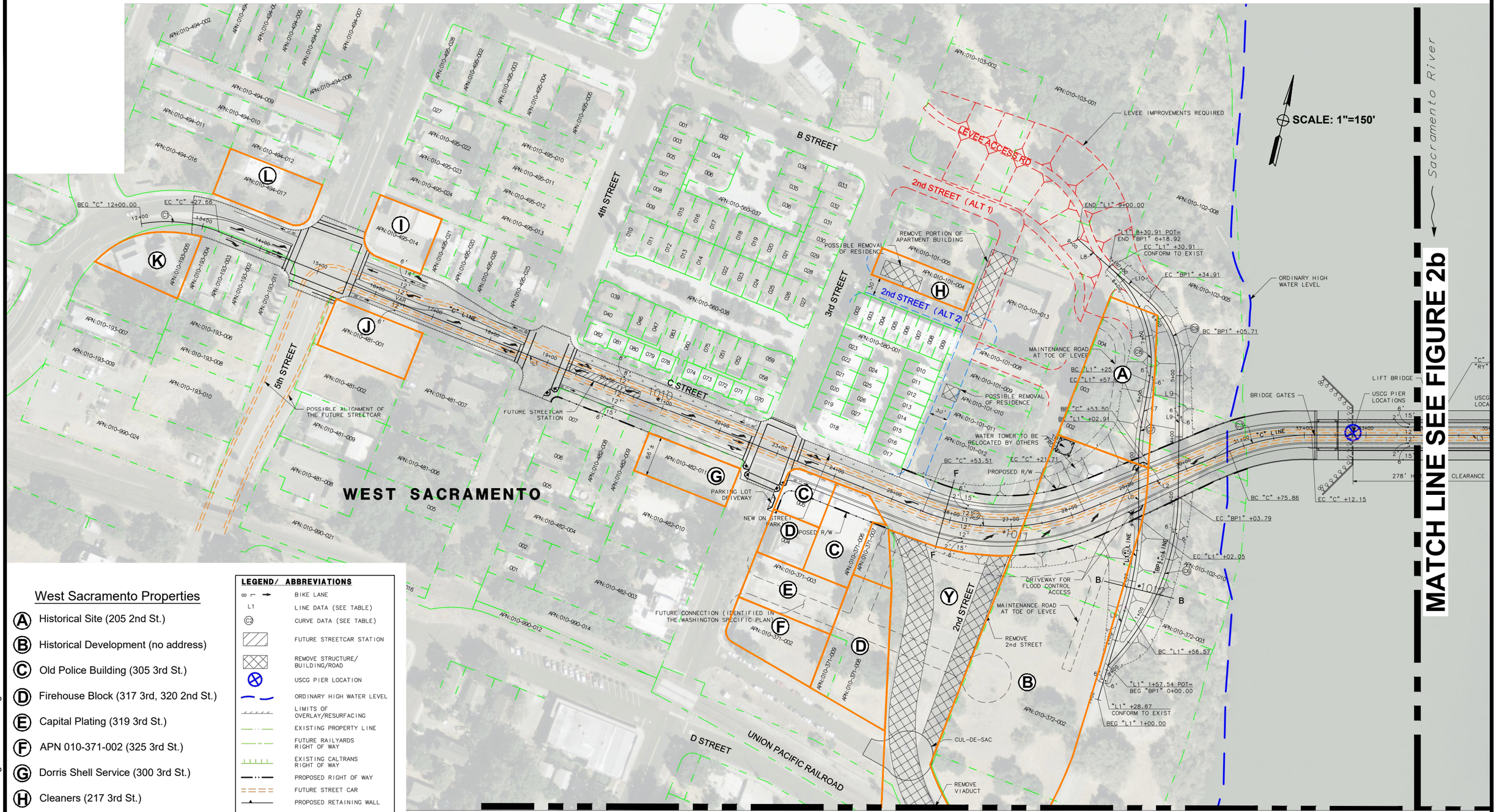
I Street Bridge Replacement Project
Sacramento, California

File No. 2584.x

March 2016

Figure 1

3/4/2016 2584.x Fig1 I Street Bridge Overhead.dwg



West Sacramento Properties

- (A) Historical Site (205 2nd St.)
- (B) Historical Development (no address)
- (C) Old Police Building (305 3rd St.)
- (D) Firehouse Block (317 3rd, 320 2nd St.)
- (E) Capital Plating (319 3rd St.)
- (F) APN 010-371-002 (325 3rd St.)
- (G) Dorris Shell Service (300 3rd St.)
- (H) Cleaners (217 3rd St.)
- (I) Martinez Gulf Station (424 C St.)
- (J) Gary's Mohawk Station (427 C St.)
- (K) Golden Eagle Garage (519 & 521 C St.)
- (L) Hudson Oil Station (500 C St.)
- (Y) Caltrans ROW at Bridge Approach

LEGEND/ ABBREVIATIONS

	BIKE LANE
L1	LINE DATA (SEE TABLE)
C2	CURVE DATA (SEE TABLE)
	FUTURE STREETCAR STATION
	REMOVE STRUCTURE/ BUILDING/ROAD
	USCG PIER LOCATION
	ORDINARY HIGH WATER LEVEL
	LIMITS OF OVERLAY/RESURFACING
	EXISTING PROPERTY LINE
	FUTURE RAILYARDS RIGHT OF WAY
	EXISTING CALTRANS RIGHT OF WAY
	PROPOSED RIGHT OF WAY
	FUTURE STREET CAR
	PROPOSED RETAINING WALL
BB/EB	BEGIN BRIDGE / END BRIDGE
PCC	POINT OF COMPOUND CURVE
PRC	POINT OF REVERSING CURVE
BC/EC	BEGIN CURVE / END CURVE
•290	CONTROL POINT
	APPROXIMATE PARCEL BOUNDARIES
A — A	CROSS SECTION LOCATION

Source: Preliminary geometric alternatives and aerial provided by Mark Thomas & Company, April 20, 2015.

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INITIAL SITE ASSESSMENT

I Street Bridge Replacement Project
Sacramento, California

File No. 2584.x

March 2016

Figure 2a

3/4/2016 2584.x Fig2 ISA I Street Bridge Overhead.dwg

LEGEND/ ABBREVIATIONS

	BIKE LANE
L1	LINE DATA (SEE TABLE)
C2	CURVE DATA (SEE TABLE)
	FUTURE STREETCAR STATION
	REMOVE STRUCTURE/ BUILDING/ROAD
	USCG PIER LOCATION
	ORDINARY HIGH WATER LEVEL
	LIMITS OF OVERLAY/RESURFACING
	EXISTING PROPERTY LINE
	FUTURE RAILYARDS RIGHT OF WAY
	EXISTING CALTRANS RIGHT OF WAY
	PROPOSED RIGHT OF WAY
	FUTURE STREET CAR
	PROPOSED RETAINING WALL
BB/EB	BEGIN BRIDGE / END BRIDGE
PCC	POINT OF COMPOUND CURVE
PRC	POINT OF REVERSING CURVE
BC/EC	BEGIN CURVE / END CURVE
290	CONTROL POINT
	APPROXIMATE PARCEL BOUNDARIES
A — A	CROSS SECTION LOCATION

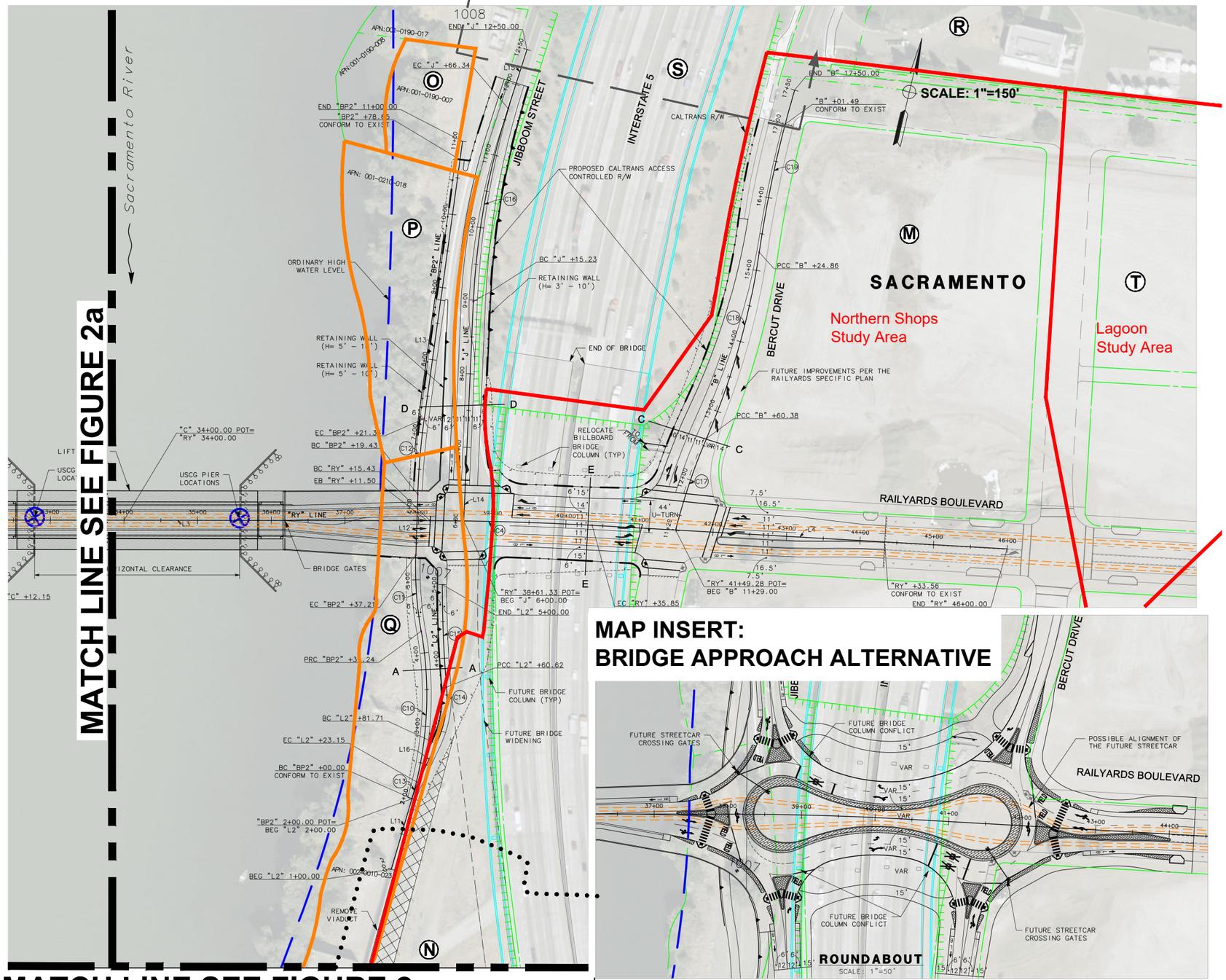
Approximate Sacramento Railyard Property Boundaries

Approximate Former Manufactured Gas Plant Boundaries

Approximate Former Associated Metals Property Boundaries

SACRAMENTO PROPERTIES

- (M) Northern Shops Study Area
- (N) Manufactured Gas Plant
- (O) APN 001-0190-007
- (P) APN 001-0210-018
- (Q) APN 001-0010-023
- (R) Water Treatment Plant
- (S) Former Associated Metals
- (T) Lagoon Study Area



Source: Preliminary geometric alternatives and aerial provided by Mark Thomas & Company, April 20, 2015.

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INITIAL SITE ASSESSMENT

I Street Bridge Replacement Project
Sacramento, California

File No. 2584.x

March 2016

Figure 2b

LEGEND/ ABBREVIATIONS

- BIKE LANE
- L1 — LINE DATA (SEE TABLE)
- C2 — CURVE DATA (SEE TABLE)
- FUTURE STREETCAR STATION
- REMOVE STRUCTURE/ BUILDING/ROAD
- USCG PIER LOCATION
- ORDINARY HIGH WATER LEVEL
- LIMITS OF OVERLAY/RESURFACING
- EXISTING PROPERTY LINE
- FUTURE RAILYARDS RIGHT OF WAY
- EXISTING CALTRANS RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- FUTURE STREET CAR
- PROPOSED RETAINING WALL
- BB/EB — BEGIN BRIDGE / END BRIDGE
- PCC — POINT OF COMPOUND CURVE
- PRC — POINT OF REVERSING CURVE
- BC/EC — BEGIN CURVE / END CURVE
- •290 — CONTROL POINT
- APPROXIMATE PARCEL BOUNDARIES
- A — A — CROSS SECTION LOCATION

West Sacramento Properties

- (B) Historical Development (no address)
- (M) Northern Shops Study Area
- (N) Manufactured Gas Plant
- (U) California State Railroad Museum APN 006-0011-006
- (V) SingChong Laundry APN 006-0011-009
- (W) Central Shops Study Area
- (X) Sacramento Station Study Area
- (Y) Caltrans ROW at Bridge Approach

Approximate Sacramento Railyard Property

Former Manufactured Gas Plant

Former Associated Metals Property

MATCH LINE SEE FIGURE 2a

MATCH LINE SEE FIGURE 2b

Former Manufactured Gas Plant

Central Shops Study Area

Northern Shops Study Area

Sacramento Station Study Area

INTERSTATE 5

SCALE: 1"=150'

REMOVE VIADUCT

EXIST I STREET BRIDGE (TO REMAIN)

REMOVE VIADUCT

BARRIER

MODIFY EXIST SIGN

Sacramento River

OLD SACRAMENTO STATE HISTORIC PARK

ACRAMENTO

SACRAMI

APN: 010-990-005

APN: 010-372-001

APN: 010-990-004

APN: 010-373-001

APN: 010-373-004

APN: 010-373-005

APN: 010-373-006

APN: 010-373-007

APN: 010-373-011

APN: 010-373-010

APN: 010-473-032

APN: 002-0010-028

APN: 002-0010-024

APN: 002-0010-027

APN: 002-0010-044

APN: 006-0011-006

APN: 006-0011-009

•1009 •1003 •1004 •1005 •1001 •1000

Source: Preliminary geometric alternatives and aerial provided by Mark Thomas & Company, April 20, 2015.

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INITIAL SITE ASSESSMENT

I Street Bridge Replacement Project
Sacramento, California

File No. 2584.x
March 2016
Figure 2c

3/4/2016 2584.x Fig2 ISA I Street Bridge Overhead.dwg

INITIAL SITE ASSESSMENT
I STREET BRIDGE REPLACEMENT PROJECT
Sacramento, California and
West Sacramento, California

APPENDIX A

Aerial Photographs

I Street Bridge Replacement
I Street/Jibboom Street
Sacramento, CA 95814

Inquiry Number: 3893331.9
April 02, 2014

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

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Date EDR Searched Historical Sources:

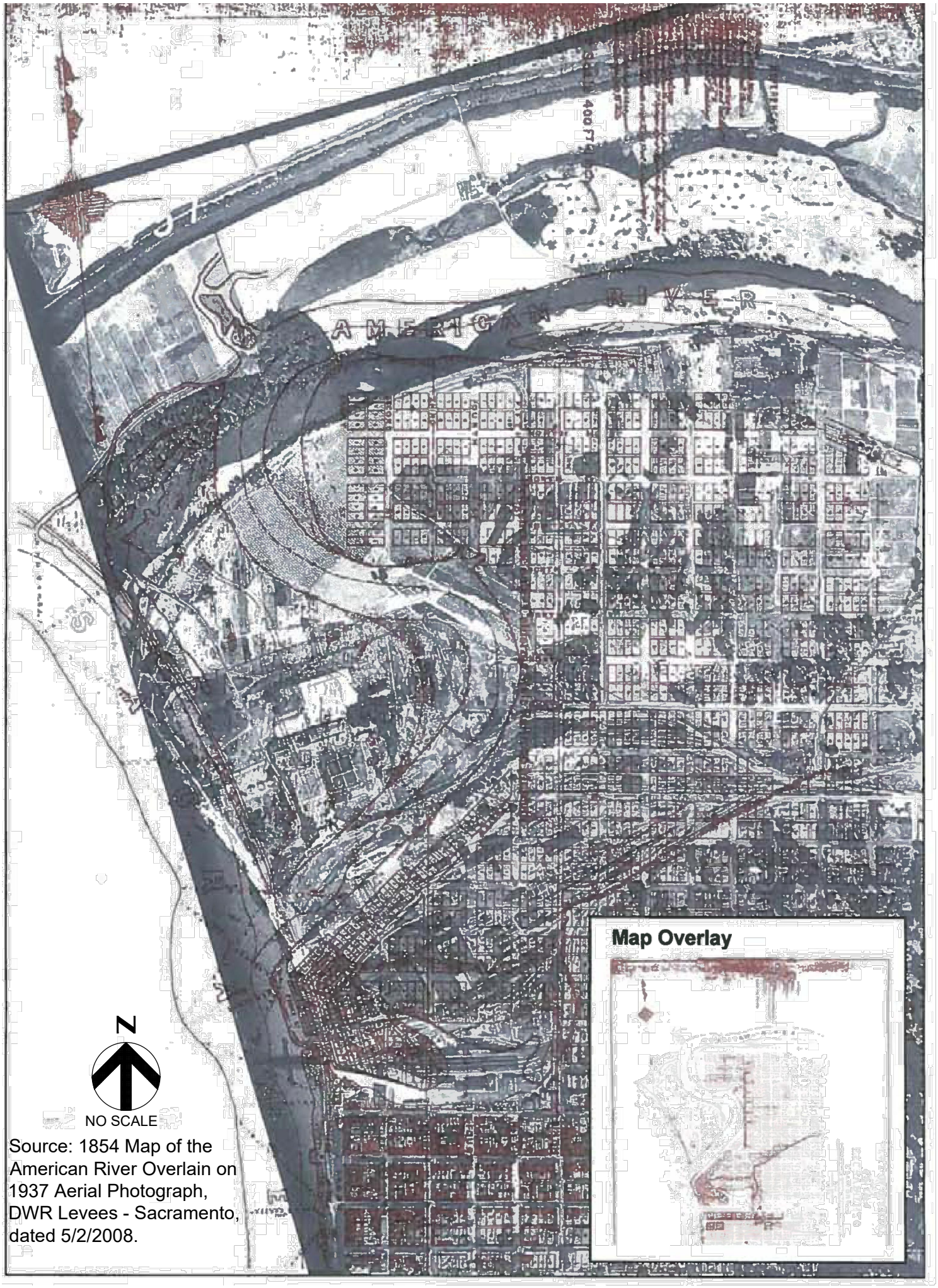
Aerial Photography April 02, 2014

Target Property:

I Street/Jibboom Street

Sacramento, CA 95814

Year	***Scale***	***Details***	***Source***
1937	Aerial Photograph. Scale: 1"=500'	Flight Year: 1937	Laval
1947	Aerial Photograph. Scale: 1"=500'	Flight Year: 1947	USGS
1957	Aerial Photograph. Scale: 1"=500'	Flight Year: 1957	Cartwright
1964	Aerial Photograph. Scale: 1"=500'	Flight Year: 1964	Cartwright
1971	Aerial Photograph. Scale: 1"=500'	Flight Year: 1971	Cartwright
1984	Aerial Photograph. Scale: 1"=500'	Flight Year: 1984	USGS
1993	Aerial Photograph. Scale: 1"=500'	Flight Year: 1993	USGS
1998	Aerial Photograph. Scale: 1"=500'	/DOQQ - acquisition dates: 1998	EDR
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	EDR
2006	Aerial Photograph. Scale: 1"=500'	Flight Year: 2006	EDR
2009	Aerial Photograph. Scale: 1"=500'	Flight Year: 2009	EDR
2010	Aerial Photograph. Scale: 1"=500'	Flight Year: 2010	EDR
2012	Aerial Photograph. Scale: 1"=500'	Flight Year: 2012	EDR



Source: 1854 Map of the American River Overlain on 1937 Aerial Photograph, DWR Levees - Sacramento, dated 5/2/2008.

INQUIRY #: 3893331.9

YEAR: 1937

= 500'

N

EDR

INQUIRY #: 3893331.9
YEAR: 1947
= 500'
N
EDR

INQUIRY #: 3893331.9
YEAR: 1957
= 500'
N
EDR

INQUIRY #: 3893331.9
YEAR: 1964
= 500'
N
EDR

INQUIRY #: 3893331.9
YEAR: 1971
= 500'
N
EDR

INQUIRY #: 3893331.9
YEAR: 1984
= 500'
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EDR

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EDR

INQUIRY #: 3893331.9
YEAR: 2005
= 500'
N
EDR

INQUIRY #: 3893331.9
YEAR: 2010
= 500'
N
EDR

INQUIRY #: 3893331.9
YEAR: 2012
= 500'
N
EDR

INITIAL SITE ASSESSMENT
I STREET BRIDGE REPLACEMENT PROJECT
Sacramento, California and
West Sacramento, California

APPENDIX B

Topographic Maps

I Street Bridge Replacement
I Street/Jibboom Street
Sacramento, CA 95814

Inquiry Number: 3893331.4
March 28, 2014

EDR Historical Topographic Map Report

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topographic Map Report

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with any questions or comments.

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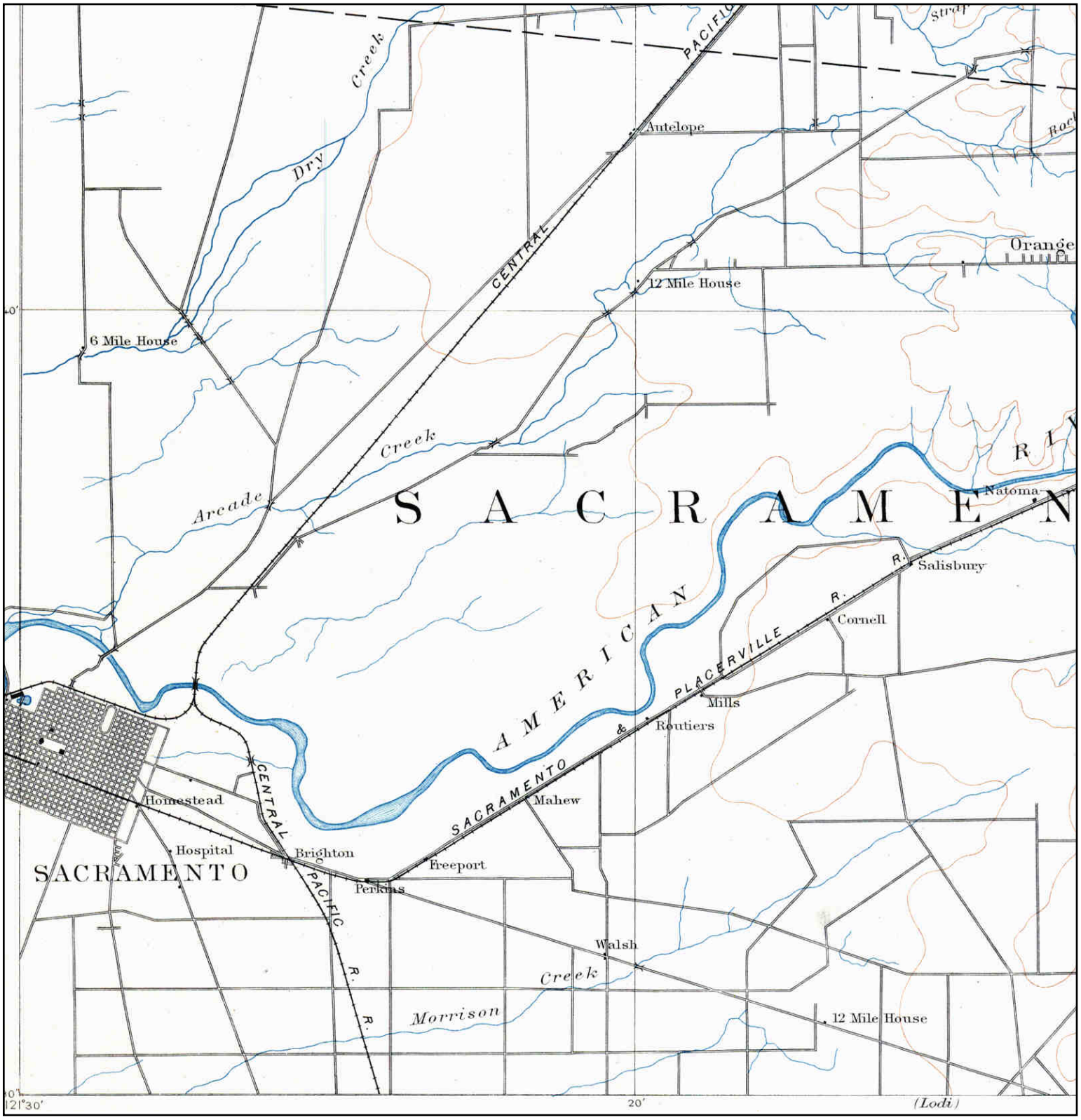
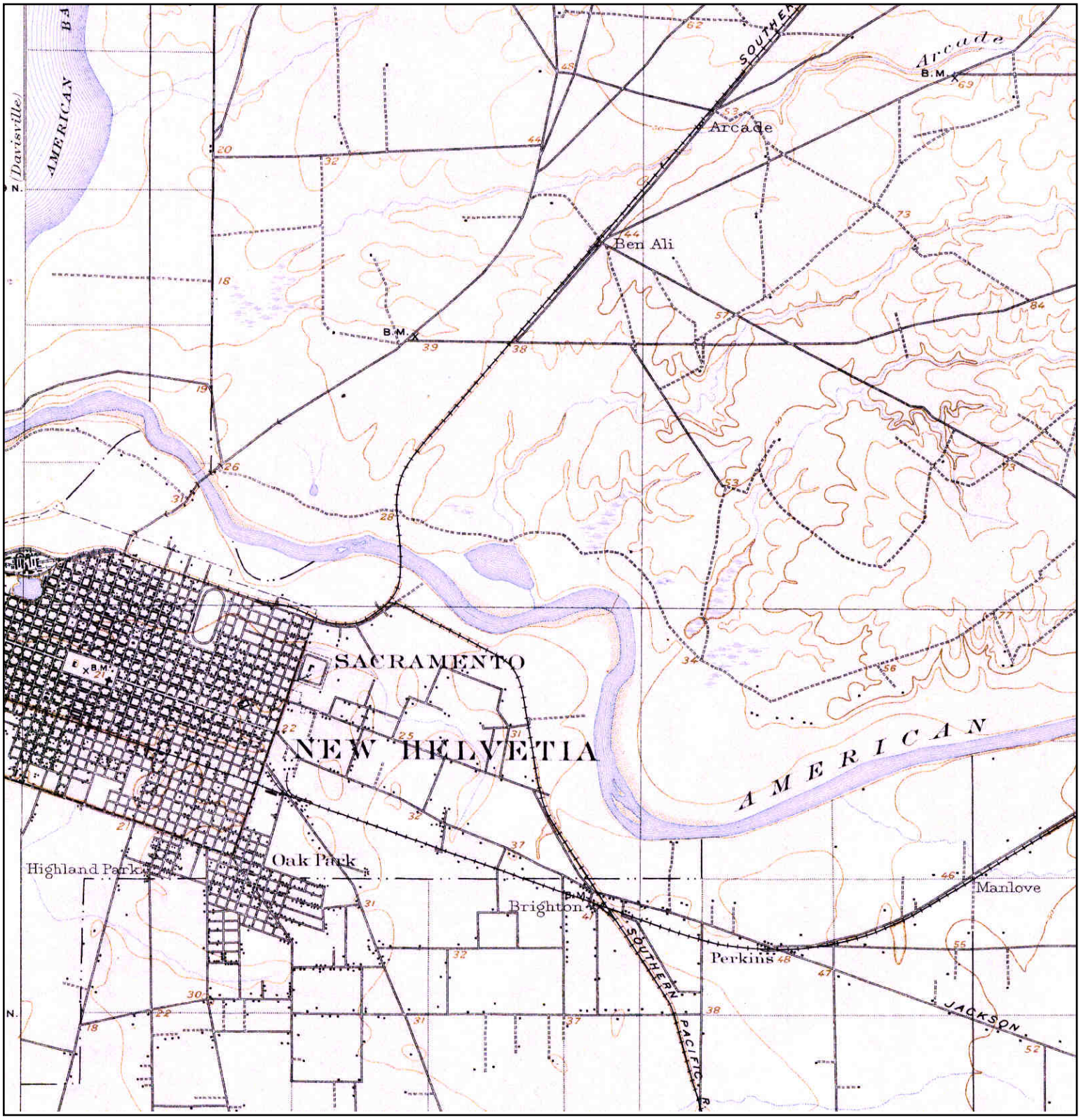
Historical Topographic Map



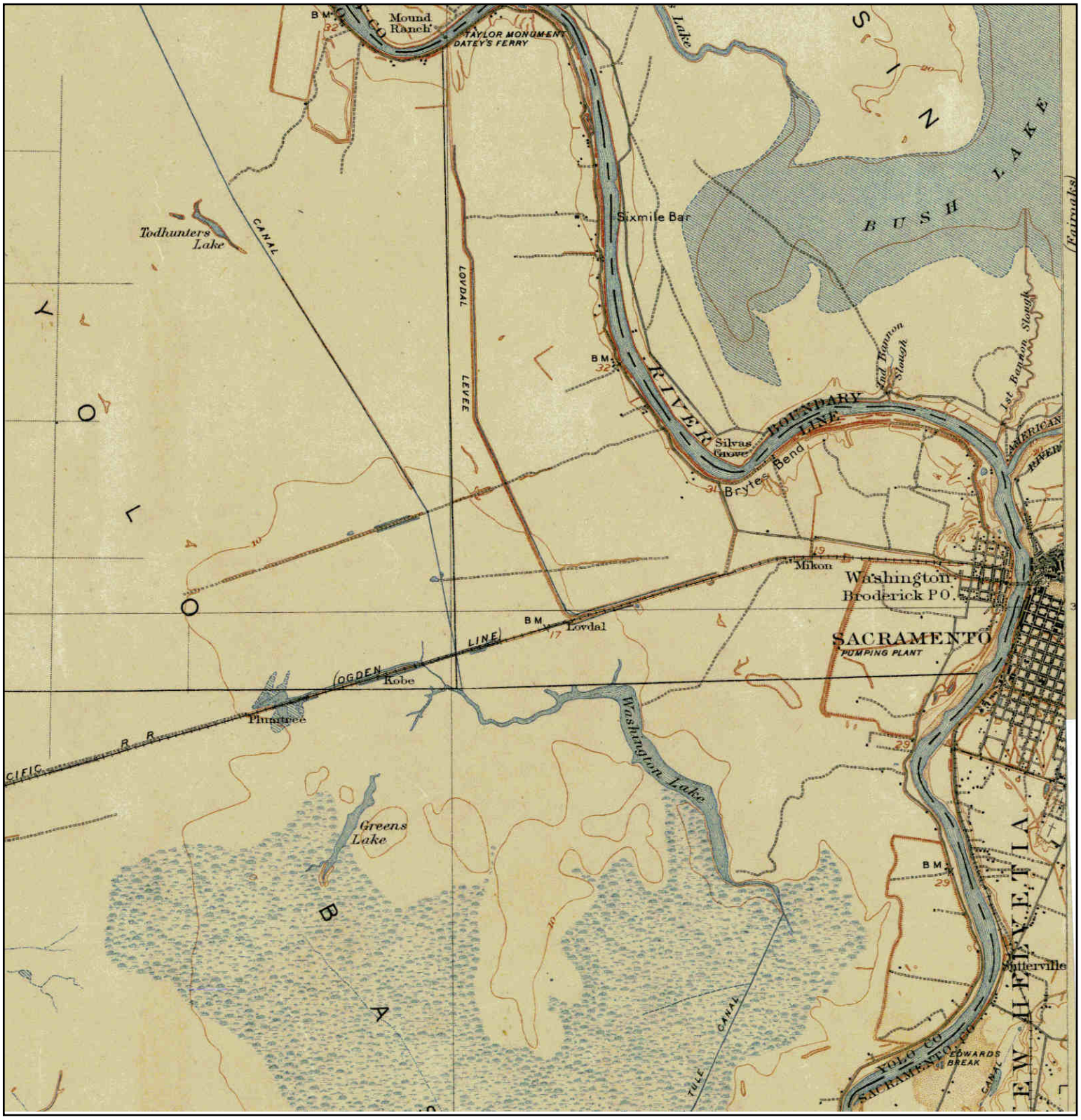
N	ADJOINING QUAD NAME: SACRAMENTO MAP YEAR: 1893 SERIES: 30 SCALE: 1:125000	SITE NAME: I Street Bridge Replacement ADDRESS: I Street/Jibboom Street Sacramento, CA 95814 LAT/LONG: 38.5886 / -121.5063	CLIENT: Blackburn Consulting CONTACT: Laura Long INQUIRY#: 3893331.4 RESEARCH DATE: 03/28/2014

Historical Topographic Map



N	ADJOINING QUAD NAME: FAIR OAKS MAP YEAR: 1902 SERIES: 15 SCALE: 1:62500	SITE NAME: I Street Bridge Replacement ADDRESS: I Street/Jibboom Street Sacramento, CA 95814 LAT/LONG: 38.5886 / -121.5063	CLIENT: Blackburn Consulting CONTACT: Laura Long INQUIRY#: 3893331.4 RESEARCH DATE: 03/28/2014

Historical Topographic Map

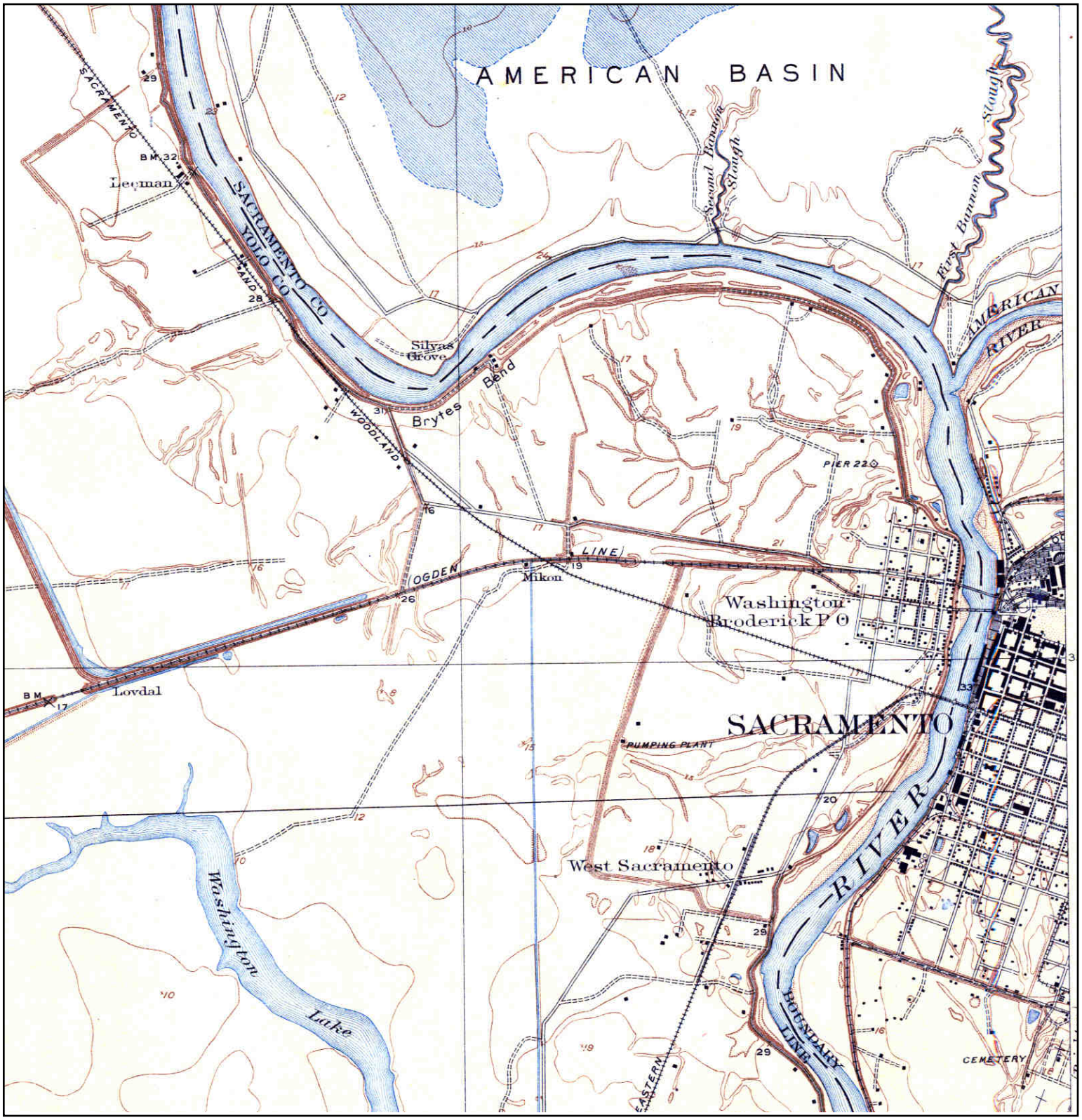


N	TARGET QUAD NAME: DAVISVILLE MAP YEAR: 1907 SERIES: 15 SCALE: 1:62500	SITE NAME: I Street Bridge Replacement ADDRESS: I Street/Jibboom Street Sacramento, CA 95814 LAT/LONG: 38.5886 / -121.5063	CLIENT: Blackburn Consulting CONTACT: Laura Long INQUIRY#: 3893331.4 RESEARCH DATE: 03/28/2014

Historical Topographic Map

N	ADJOINING QUAD				
	NAME:	BRIGHTON	SITE NAME:	I Street Bridge Replacement	CLIENT: Blackburn Consulting
	MAP YEAR:	1911	ADDRESS:	I Street/Jibboom Street	CONTACT: Laura Long
				Sacramento, CA 95814	INQUIRY#: 3893331.4
	SERIES:	7.5	LAT/LONG:	38.5886 / -121.5063	RESEARCH DATE: 03/28/2014
	SCALE:	1:31680			

Historical Topographic Map



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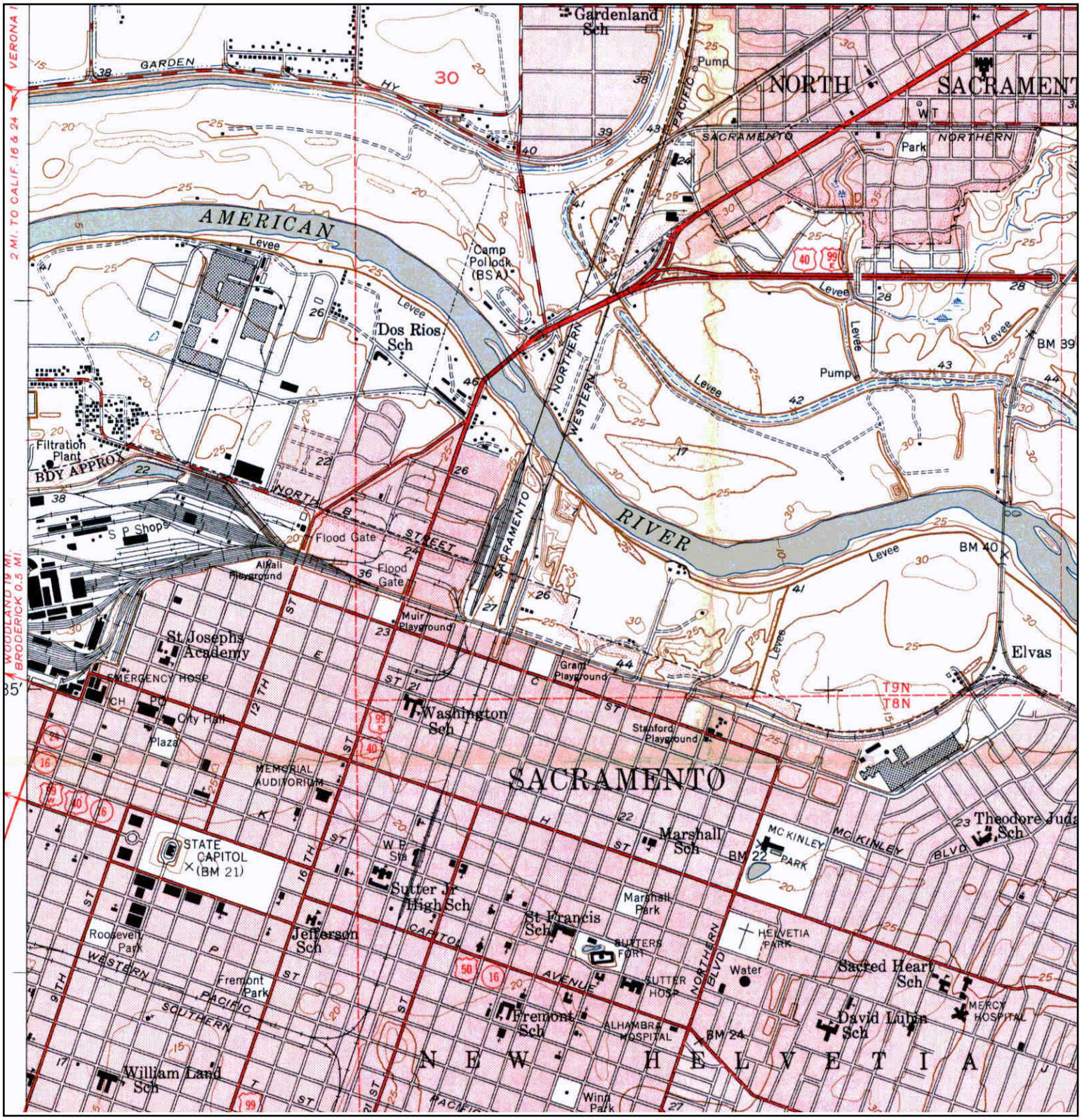
Historical Topographic Map



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	MAP YEAR:	1949	ADDRESS:	I Street/Jibboom Street	CONTACT: Laura Long
				Sacramento, CA 95814	INQUIRY#: 3893331.4
	SERIES:	7.5	LAT/LONG:	38.5886 / -121.5063	RESEARCH DATE: 03/28/2014
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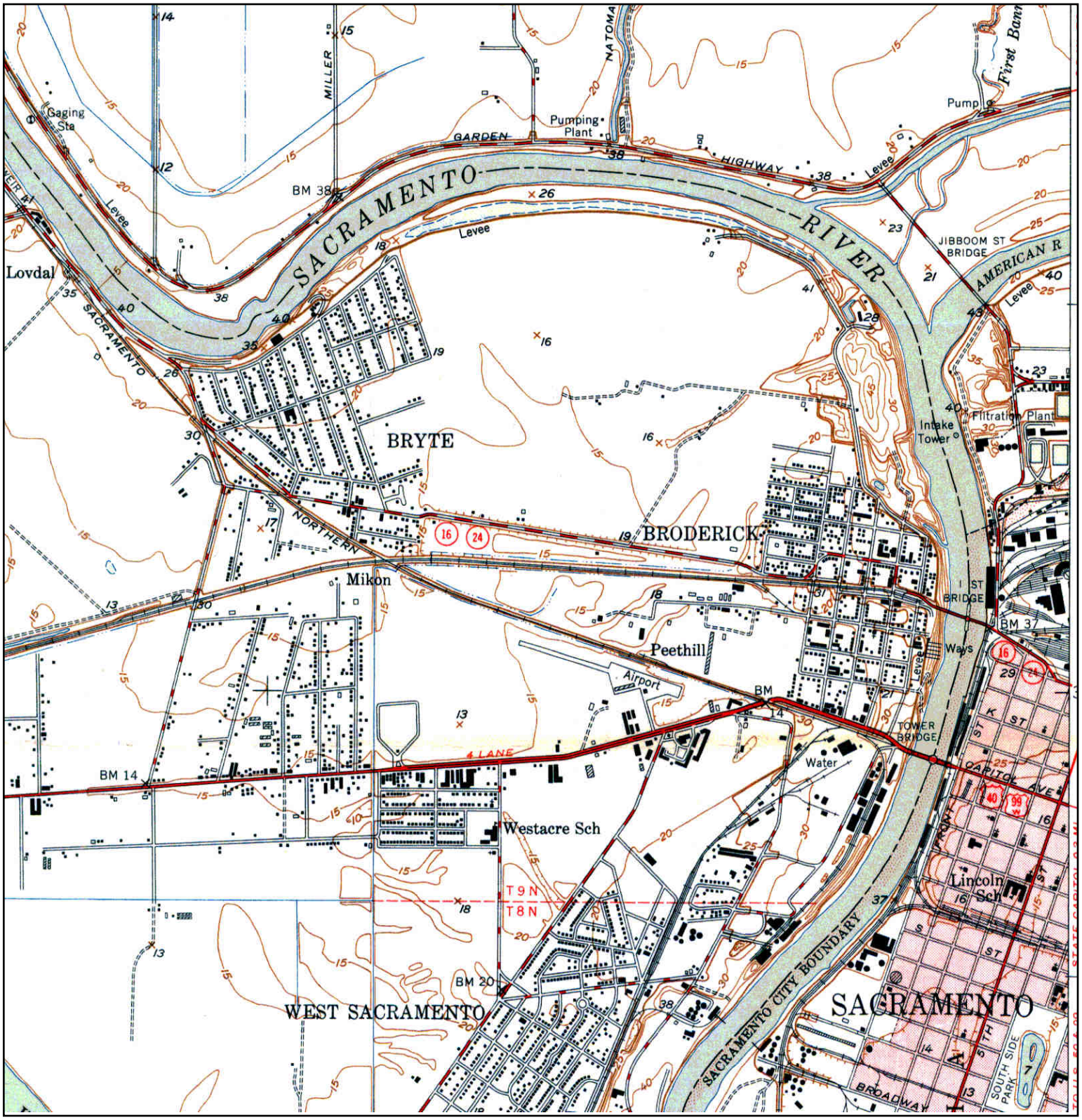
Historical Topographic Map



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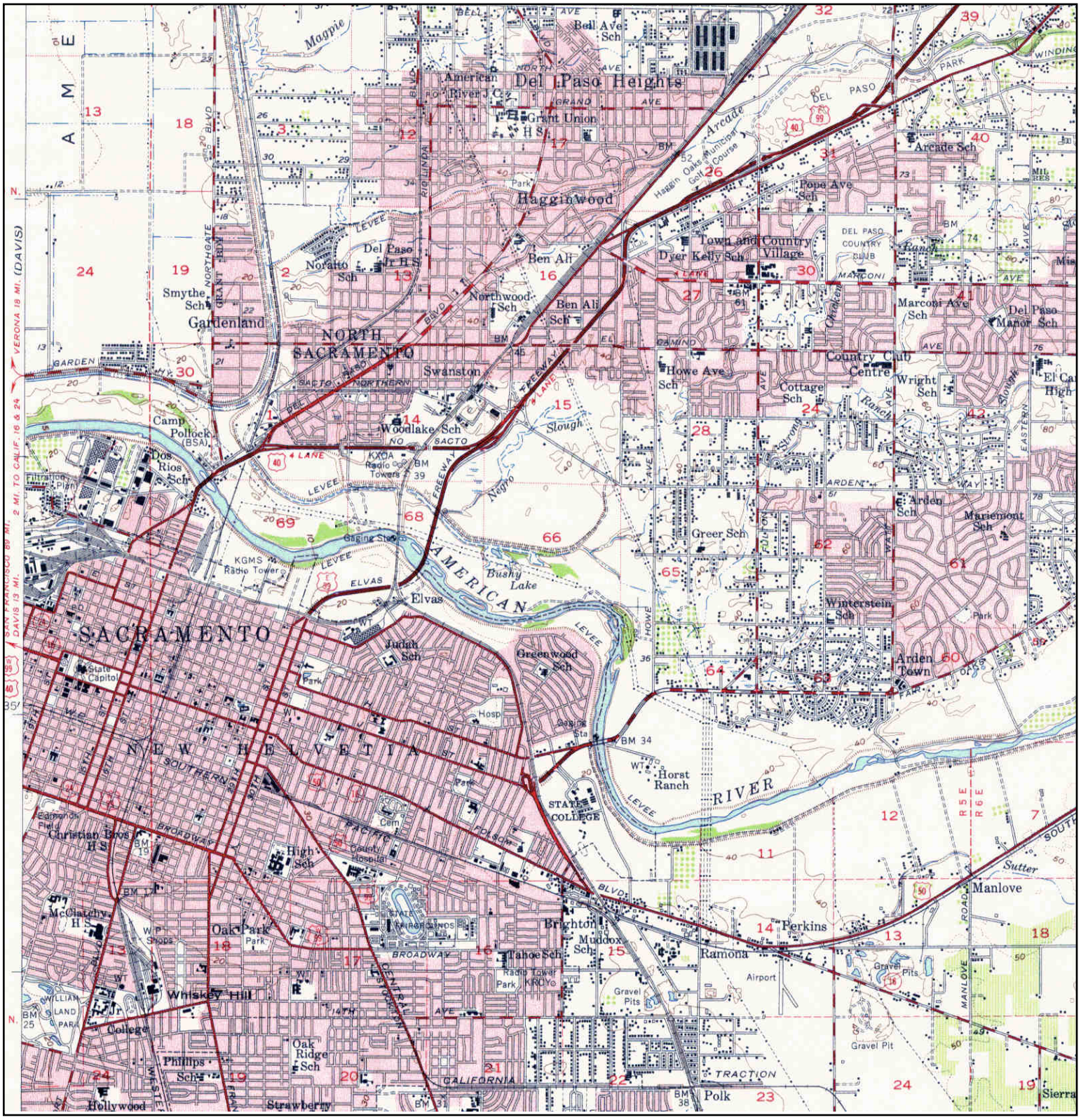
Historical Topographic Map



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	MAP YEAR:	1954	ADDRESS:	I Street/Jibboom Street	CONTACT: Laura Long
				Sacramento, CA 95814	INQUIRY#: 3893331.4
	SERIES:	15	LAT/LONG:	38.5886 / -121.5063	RESEARCH DATE: 03/28/2014
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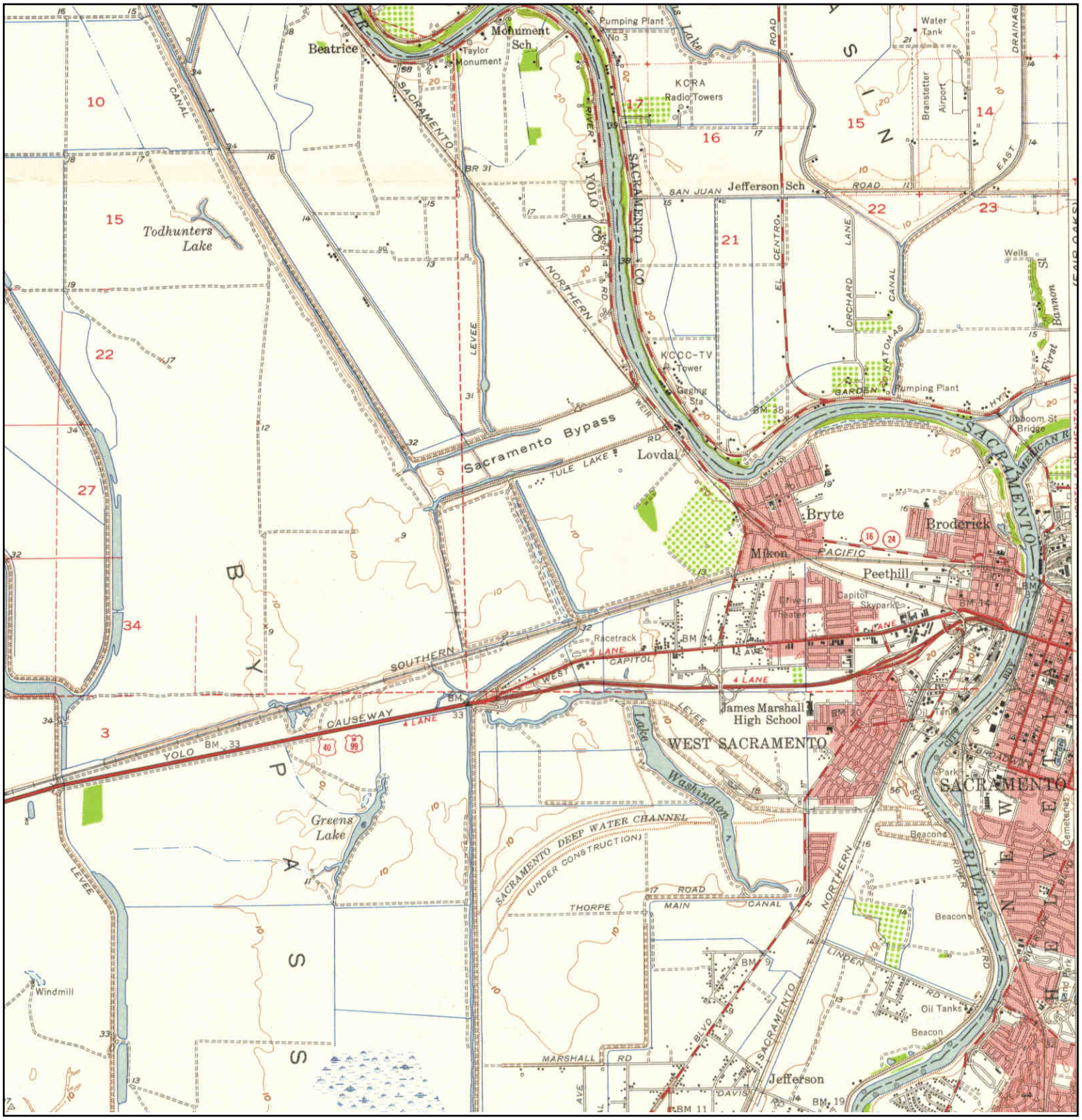

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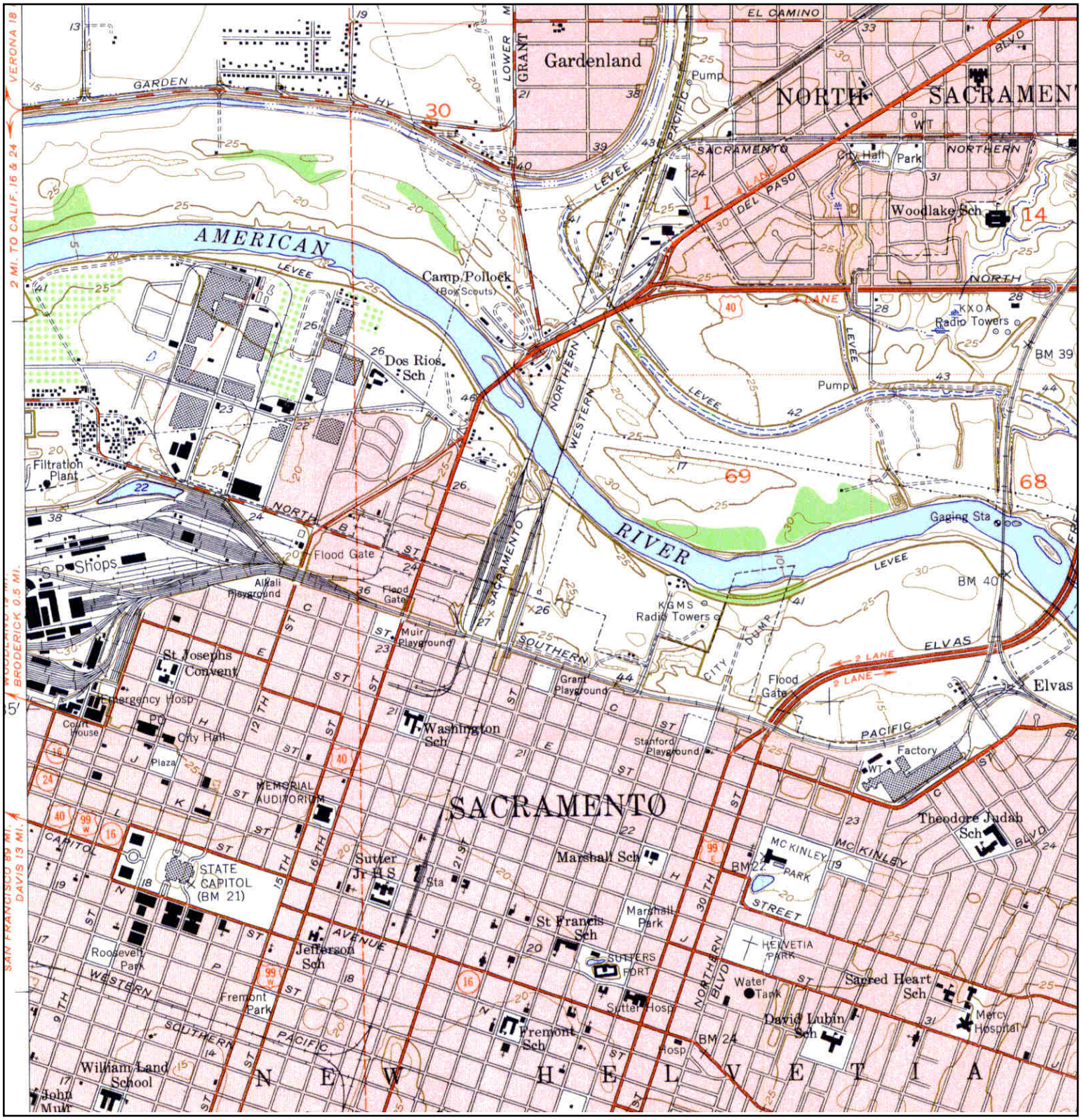
Historical Topographic Map



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	MAP YEAR:	1954	ADDRESS:	I Street/Jibboom Street	CONTACT: Laura Long
				Sacramento, CA 95814	INQUIRY#: 3893331.4
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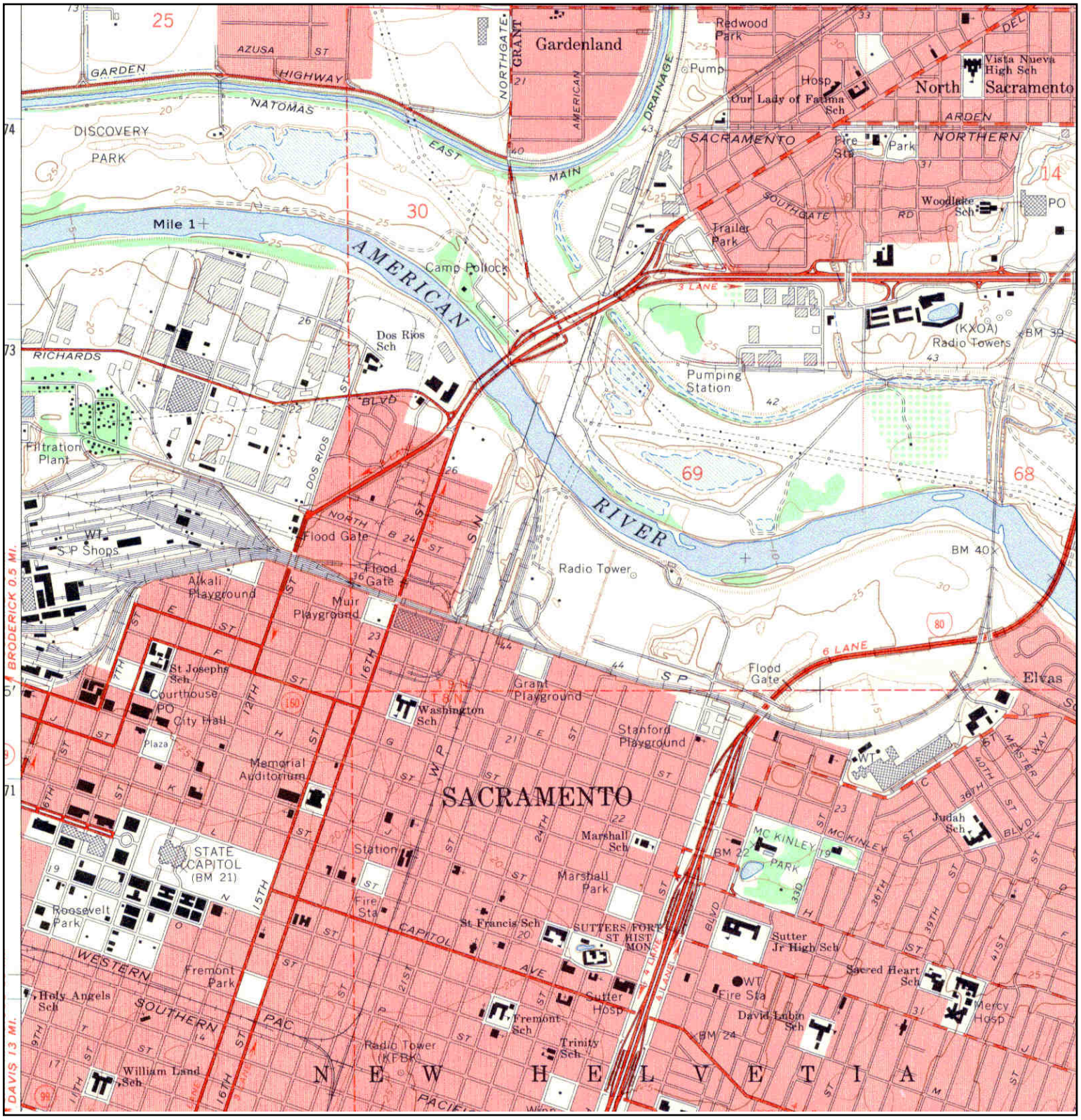
Historical Topographic Map



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				Sacramento, CA 95814	INQUIRY#: 3893331.4
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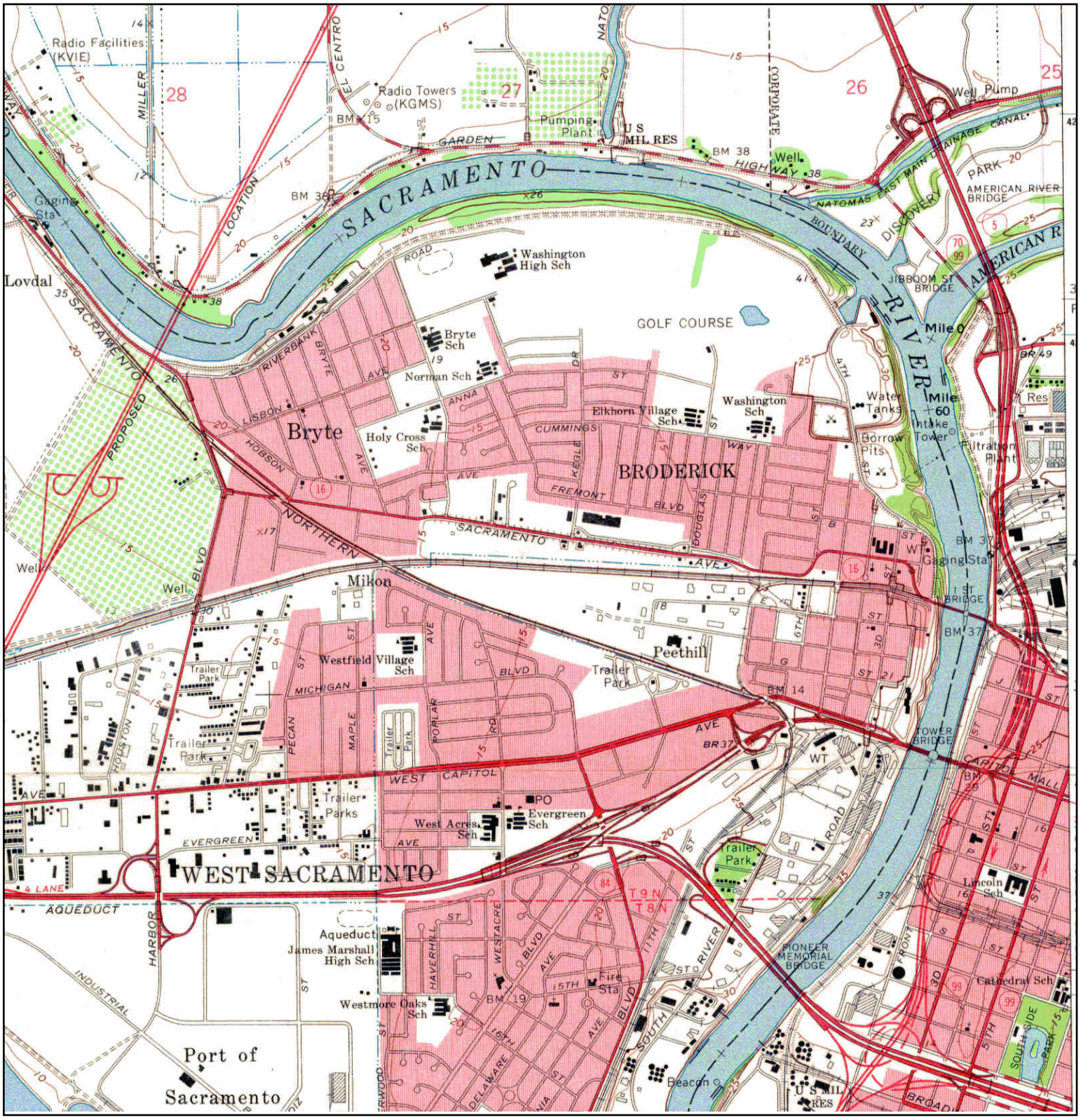

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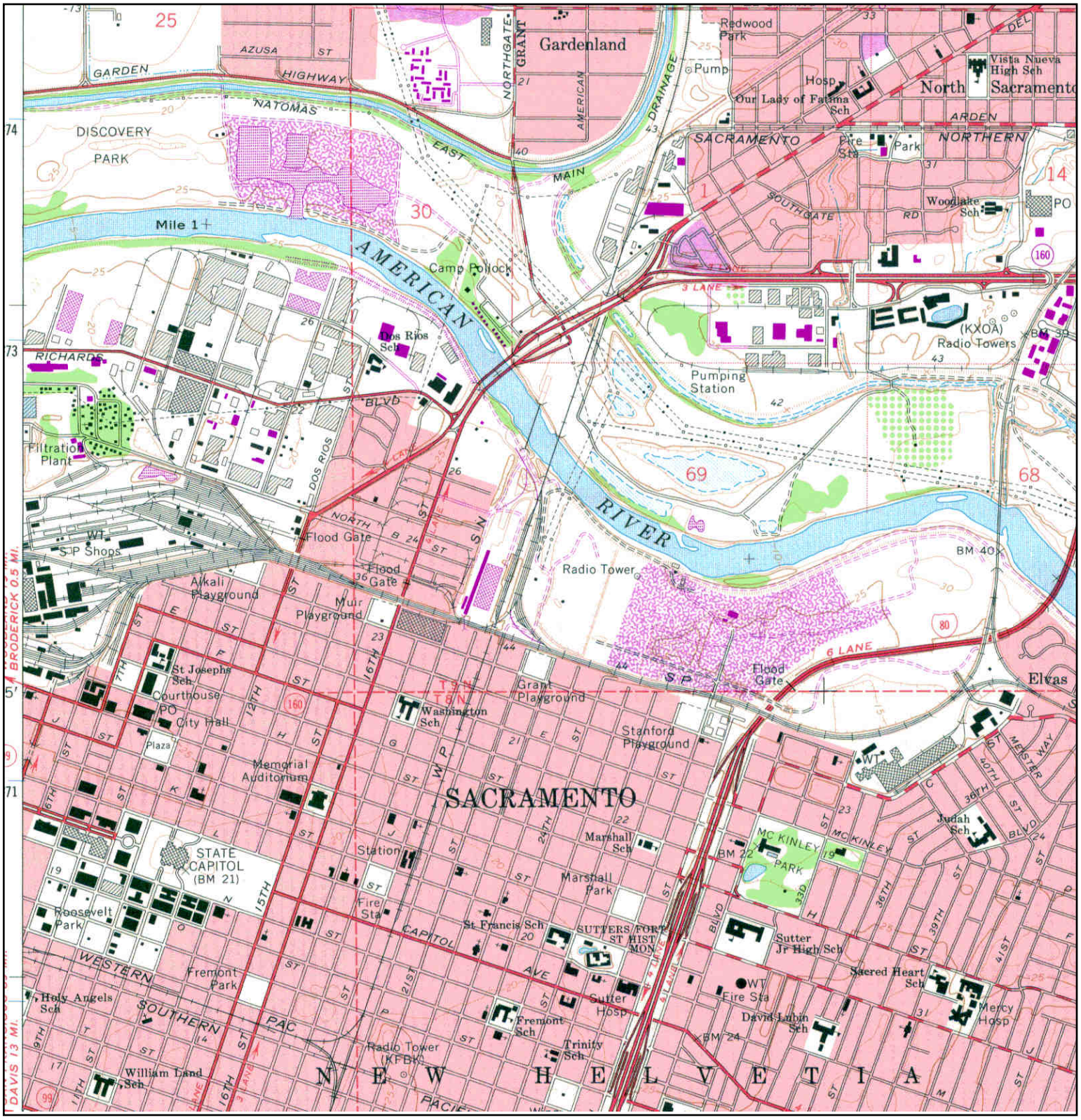

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	MAP YEAR:	1975	ADDRESS:	I Street/Jibboom Street	CONTACT: Laura Long
	PHOTOREVISED FROM :	1967		Sacramento, CA 95814	INQUIRY#: 3893331.4
	SERIES:	7.5	LAT/LONG:	38.5886 / -121.5063	RESEARCH DATE: 03/28/2014
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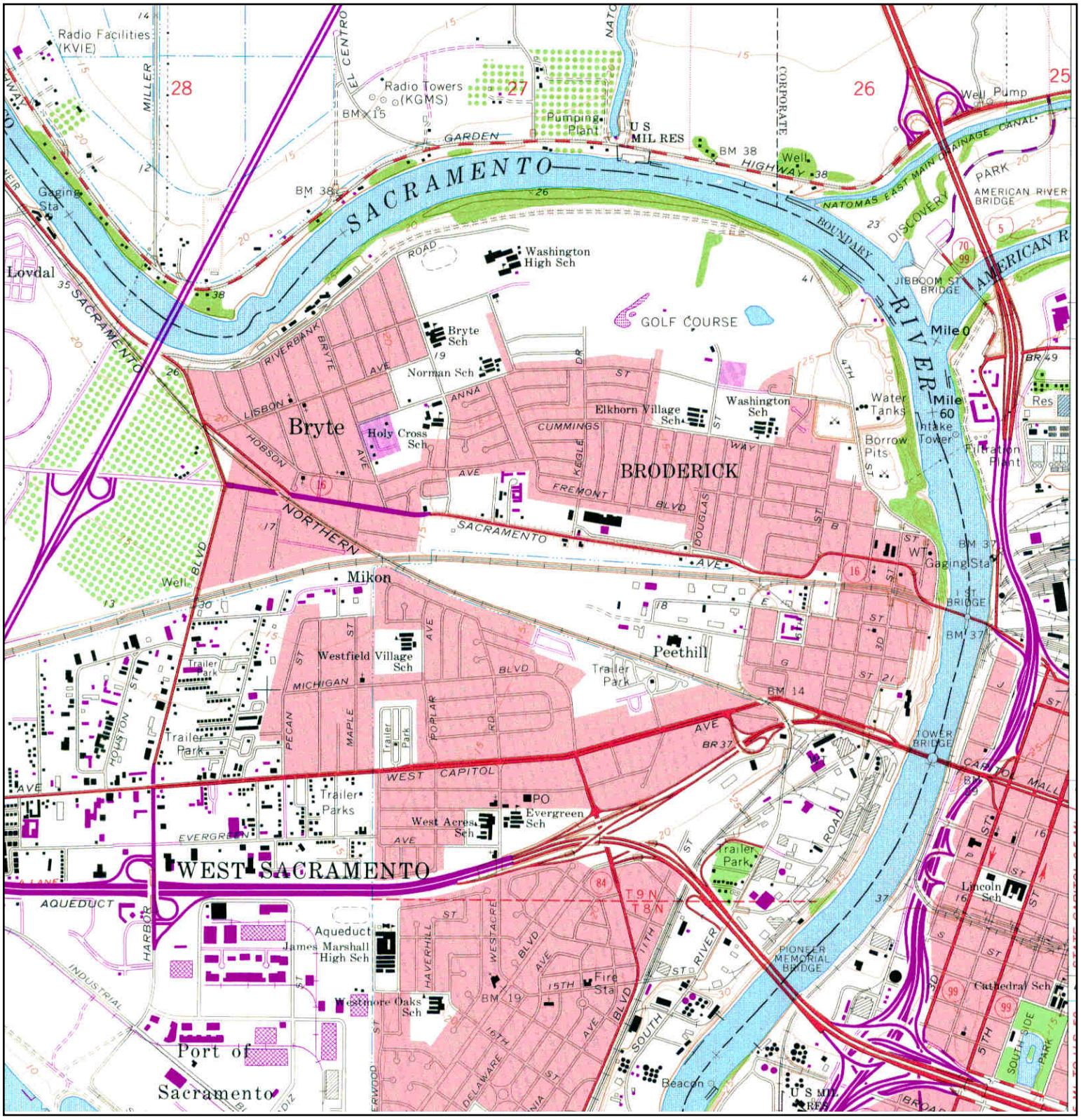

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	MAP YEAR:	1975	ADDRESS:	I Street/Jibboom Street	CONTACT: Laura Long
	PHOTOREVISED FROM :	1967		Sacramento, CA 95814	INQUIRY#: 3893331.4
	SERIES:	7.5	LAT/LONG:	38.5886 / -121.5063	RESEARCH DATE: 03/28/2014
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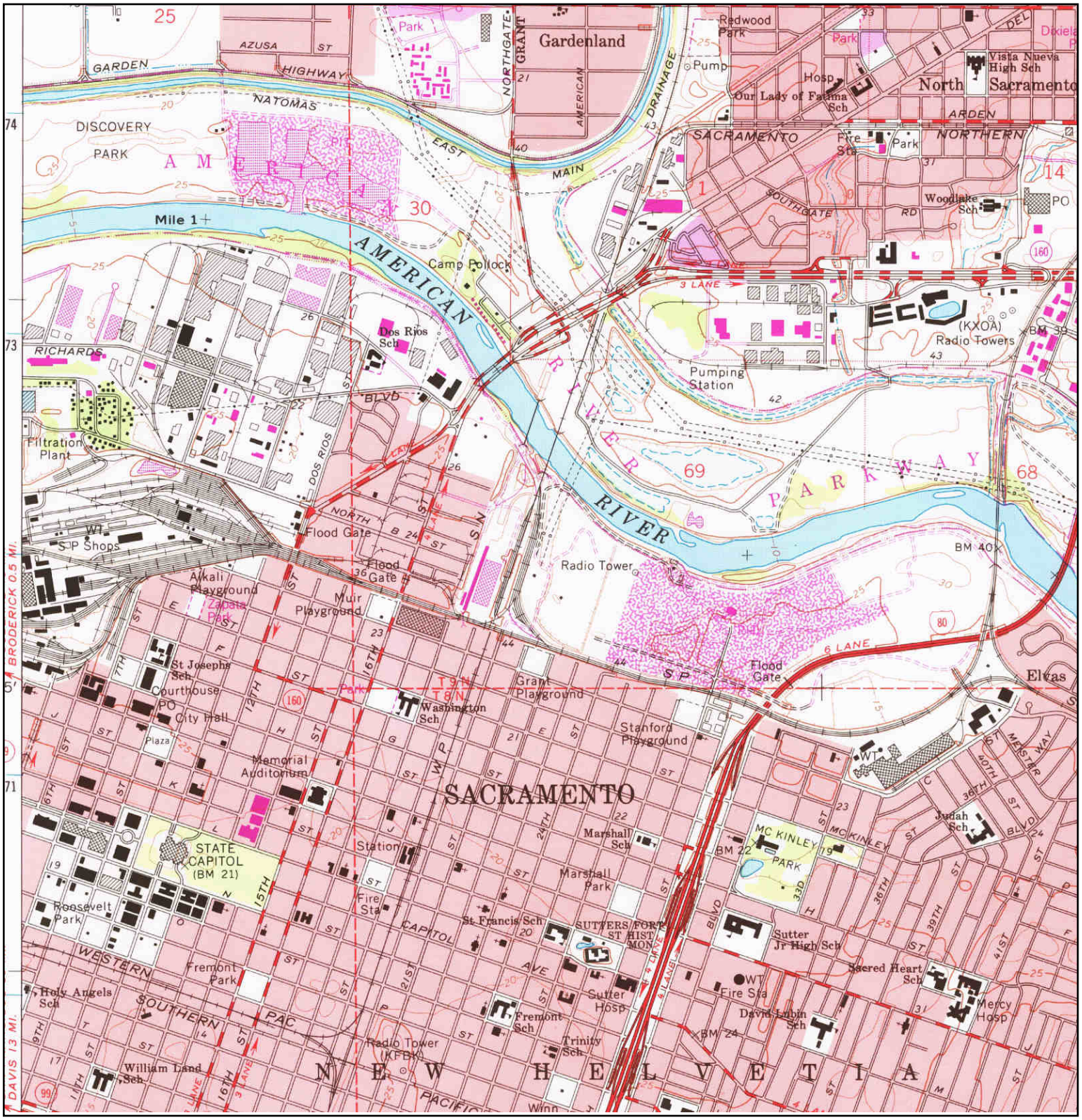

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	NAME: SACRAMENTO EAST	SITE NAME: I Street Bridge Replacement	CLIENT: Blackburn Consulting
	MAP YEAR: 1980	ADDRESS: I Street/Jibboom Street	CONTACT: Laura Long
	PHOTOREVISED FROM :1967	Sacramento, CA 95814	INQUIRY#: 3893331.4
	SERIES: 7.5	LAT/LONG: 38.5886 / -121.5063	RESEARCH DATE: 03/28/2014
	SCALE: 1:24000		

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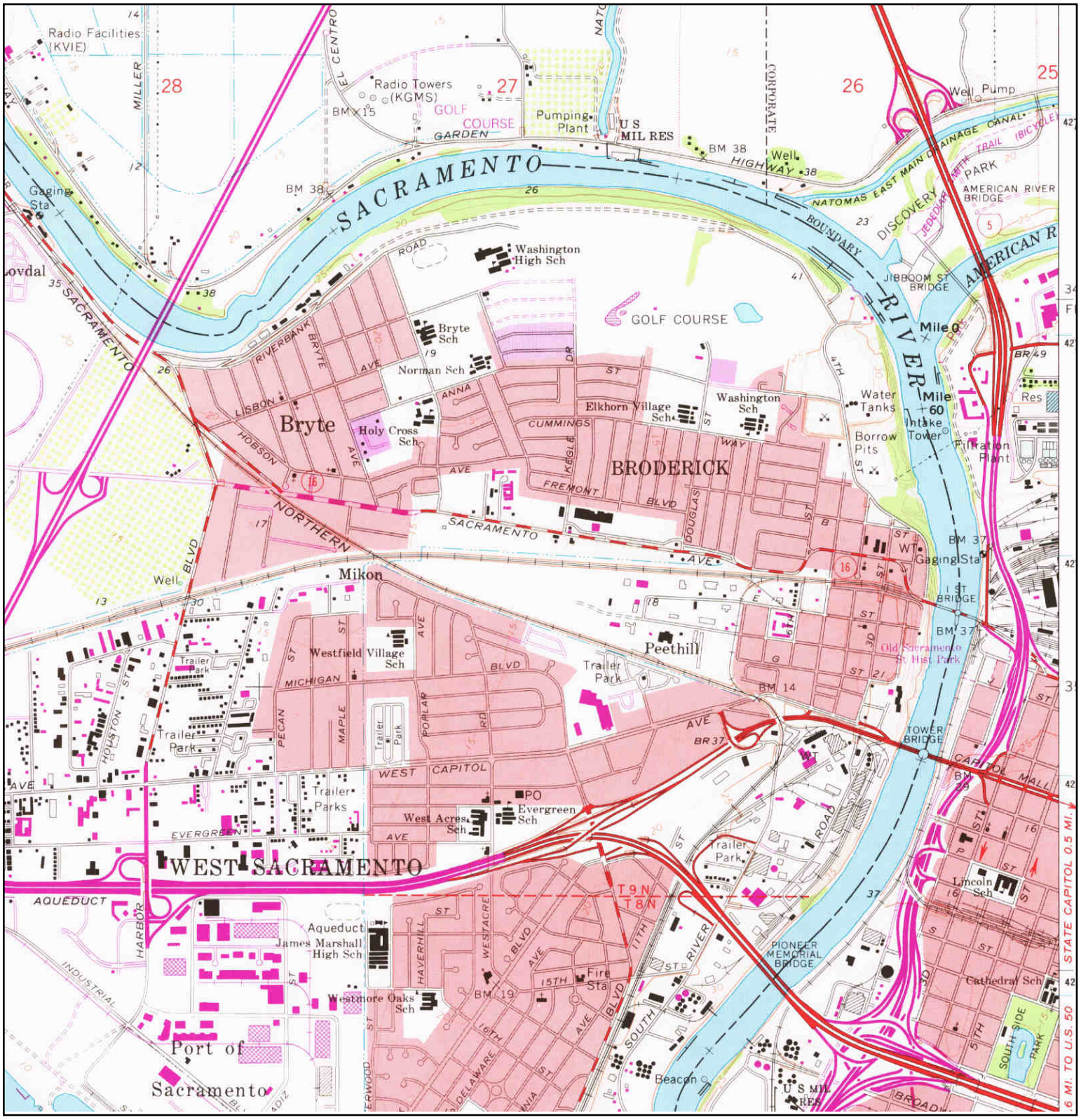

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	MAP YEAR:	1980	ADDRESS:	I Street/Jibboom Street	CONTACT: Laura Long
	PHOTOREVISED FROM :	1967		Sacramento, CA 95814	INQUIRY#: 3893331.4
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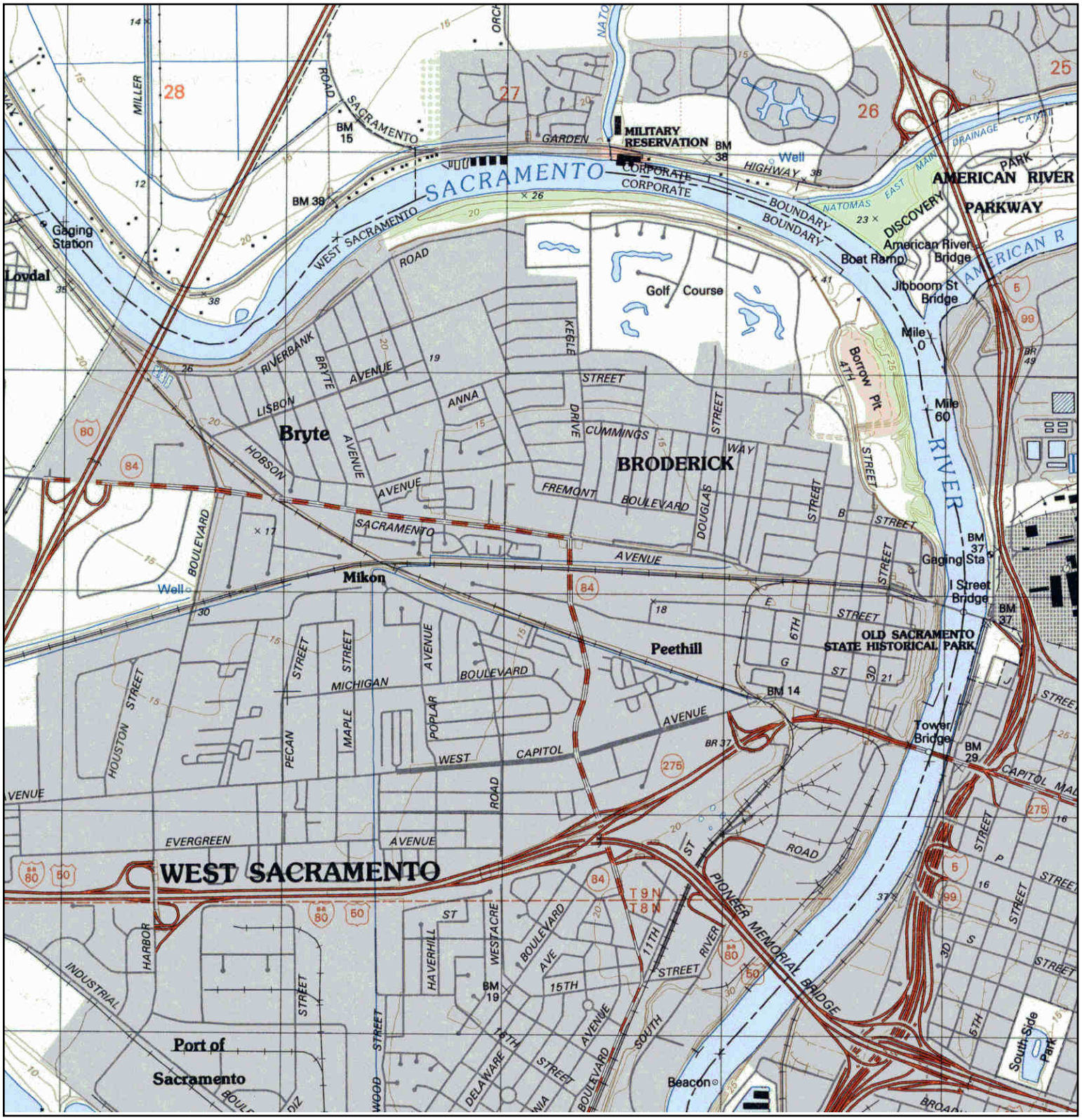

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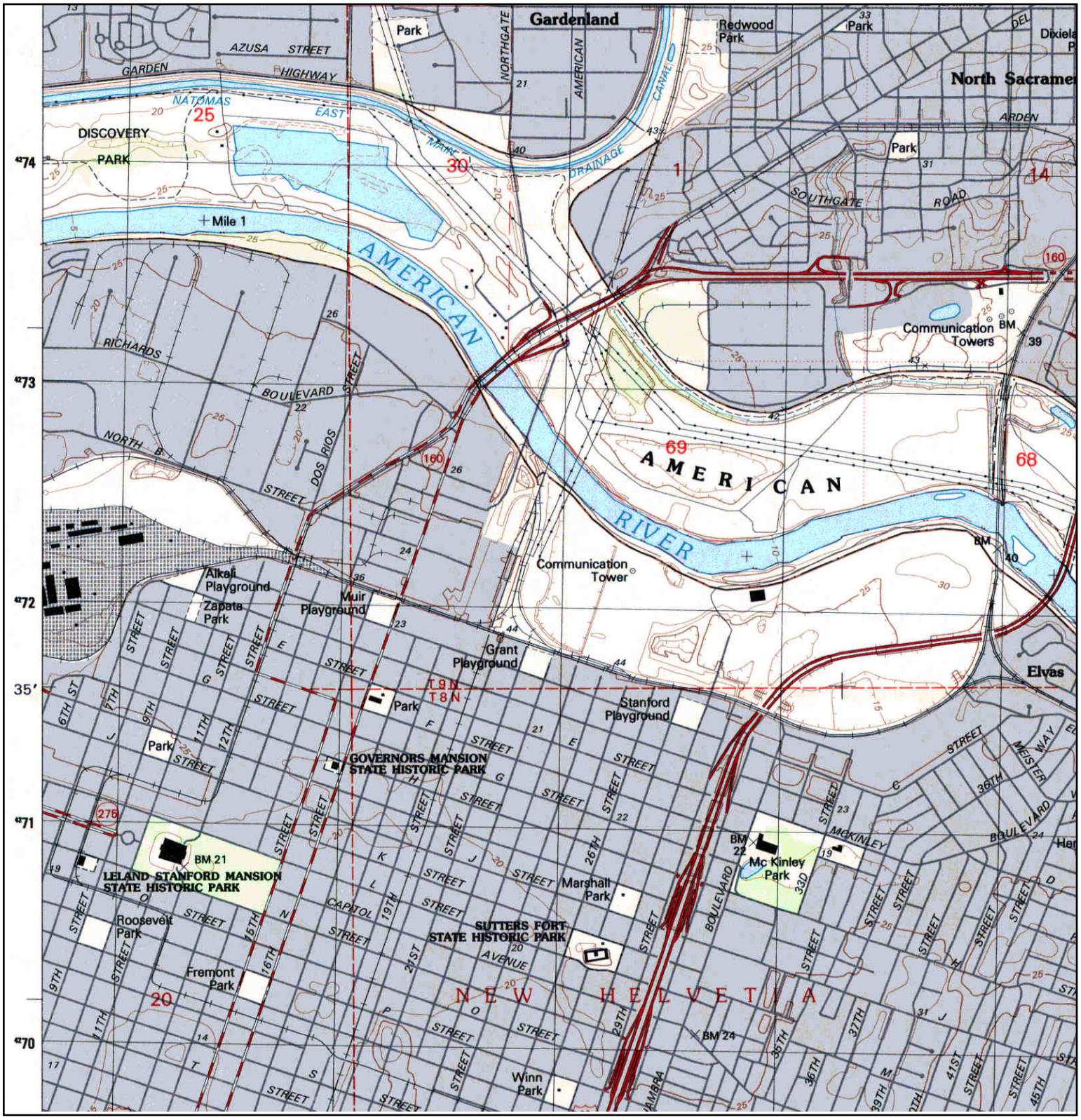
Historical Topographic Map



N	ADJOINING QUAD				
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	MAP YEAR:	1992	ADDRESS:	I Street/Jibboom Street	CONTACT: Laura Long
				Sacramento, CA 95814	INQUIRY#: 3893331.4
	SERIES:	7.5	LAT/LONG:	38.5886 / -121.5063	RESEARCH DATE: 03/28/2014
	SCALE:	1:24000			

INITIAL SITE ASSESSMENT
I STREET BRIDGE REPLACEMENT PROJECT
Sacramento, California and
West Sacramento, California

APPENDIX C

Sanborn Maps

I Street Bridge Replacement
I Street/Jibboom Street
Sacramento, CA 95814

Inquiry Number: 3893331.3
April 01, 2014

Certified Sanborn® Map Report

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

4/01/14

Site Name:
I Street Bridge Replacement
I Street/Jibboom Street
Sacramento, CA 95814

Client Name:
Blackburn Consulting
11521 Blocker Drive
Auburn, CA 95603

EDR Inquiry # 3893331.3

Contact: Laura Long

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Blackburn Consulting were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, State, Zip: Sacramento, CA 95814
Cross Street:
P.O. # 10432
Project: I Street Bridge Replacement
Certification # 5524-423E-B51B

Maps Provided:

1970	1915
1968	1895
1960	
1957	
1952	
1950	

Sanborn® Library search results
Certification # 5524-423E-B51B

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

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1895 Certified Sanborn Map

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Certification # 5524-423E-B51B

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B
Copyright: 1895

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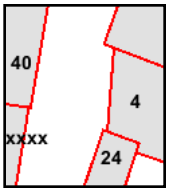
Outlined areas indicate map sheets within the collection.



Volume 1, Sheet 4
Volume 1, Sheet 4
Volume 1, Sheet 24
Volume 1, Sheet xxxx
Volume 1, Sheet 40

0 Feet 165 330 660

N

1895 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B
Copyright: 1895

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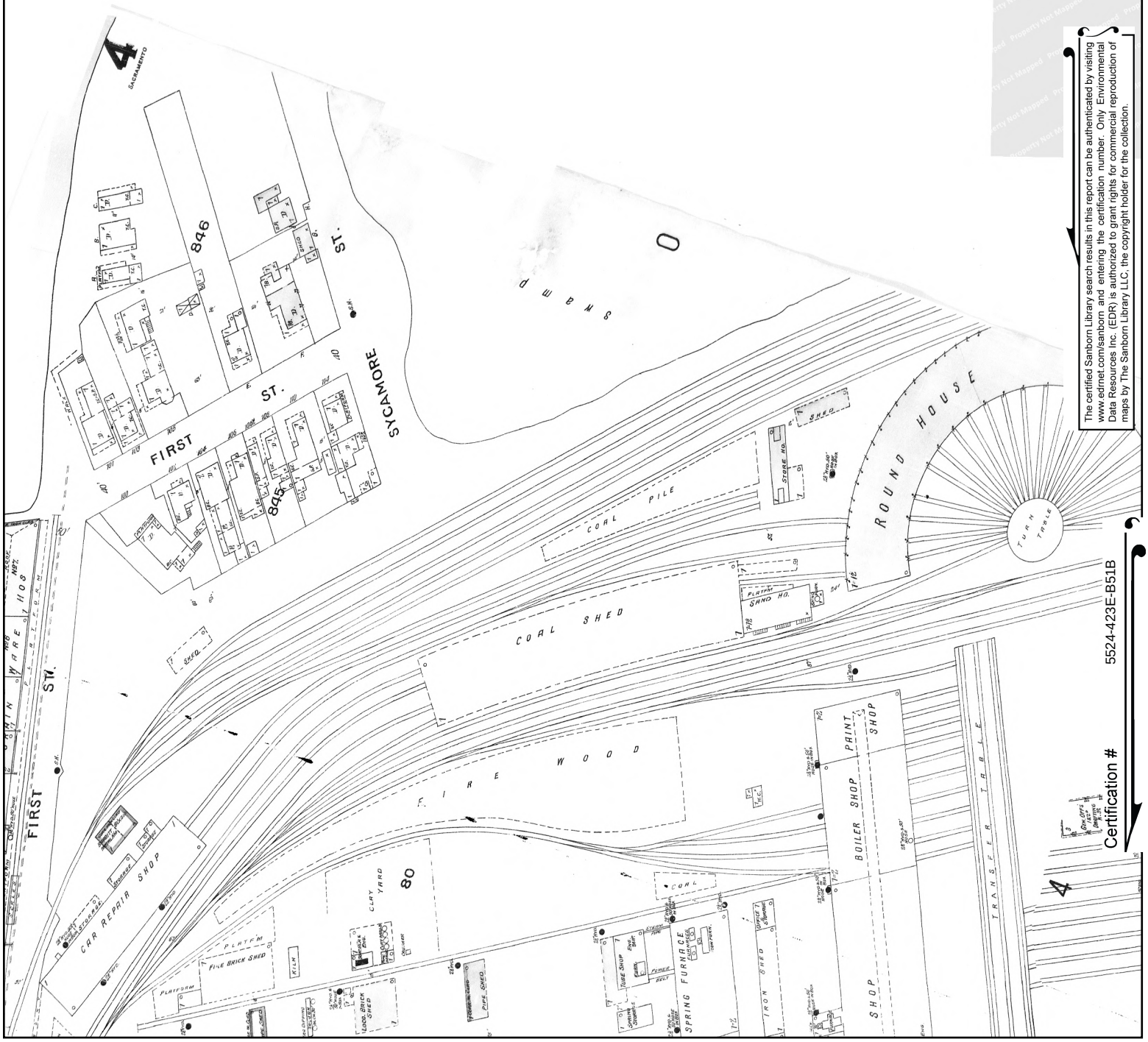

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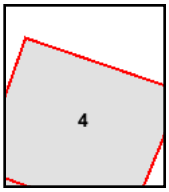

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Certification # 5524-423E-B51B

1895 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B
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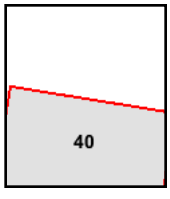

Volume 1, Sheet 40

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1895 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street

City, ST, ZIP: Sacramento CA 95814

Client: Blackburn Consulting

EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B

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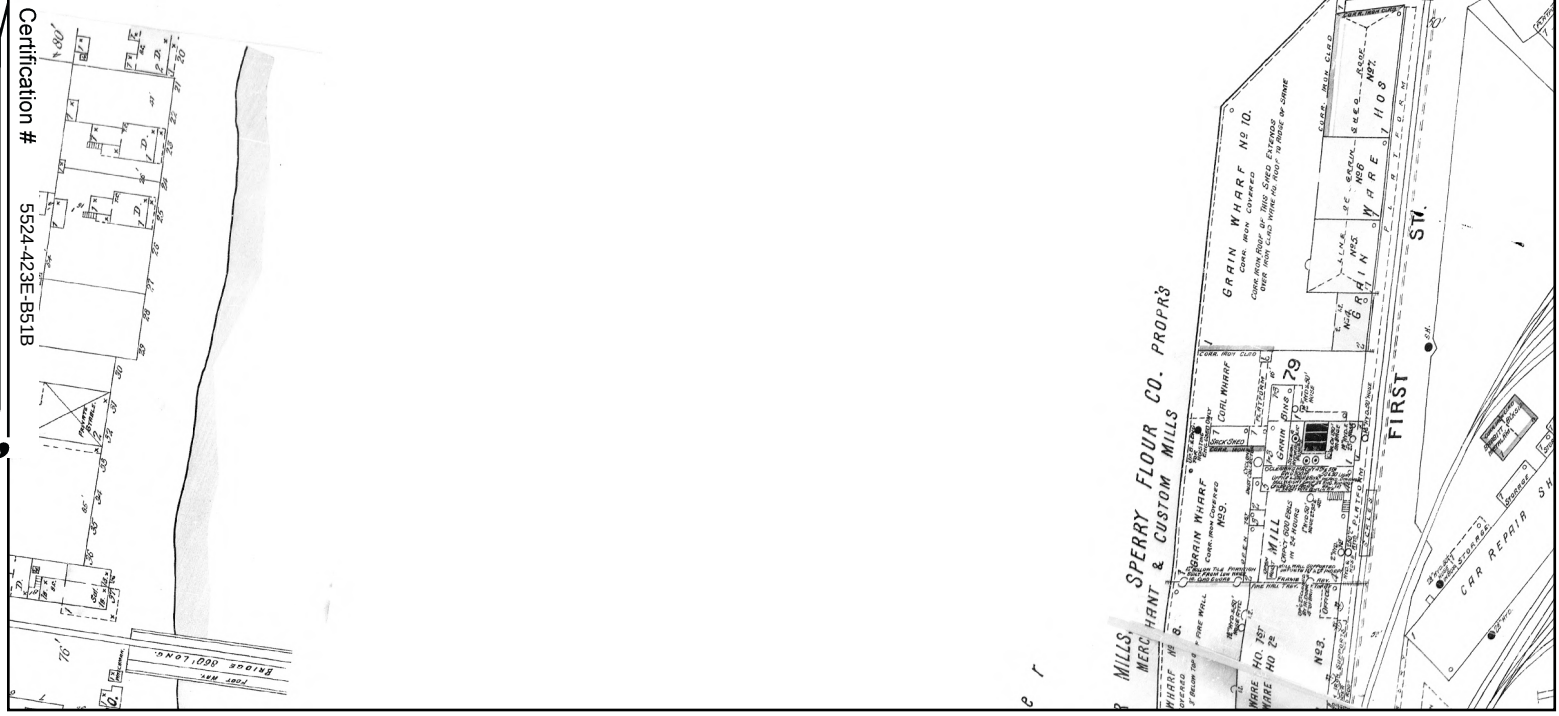
Certification # 5524-423E-B51B



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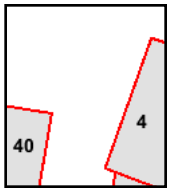

Volume 1, Sheet 4
Volume 1, Sheet 40

0 Feet 165 330 660

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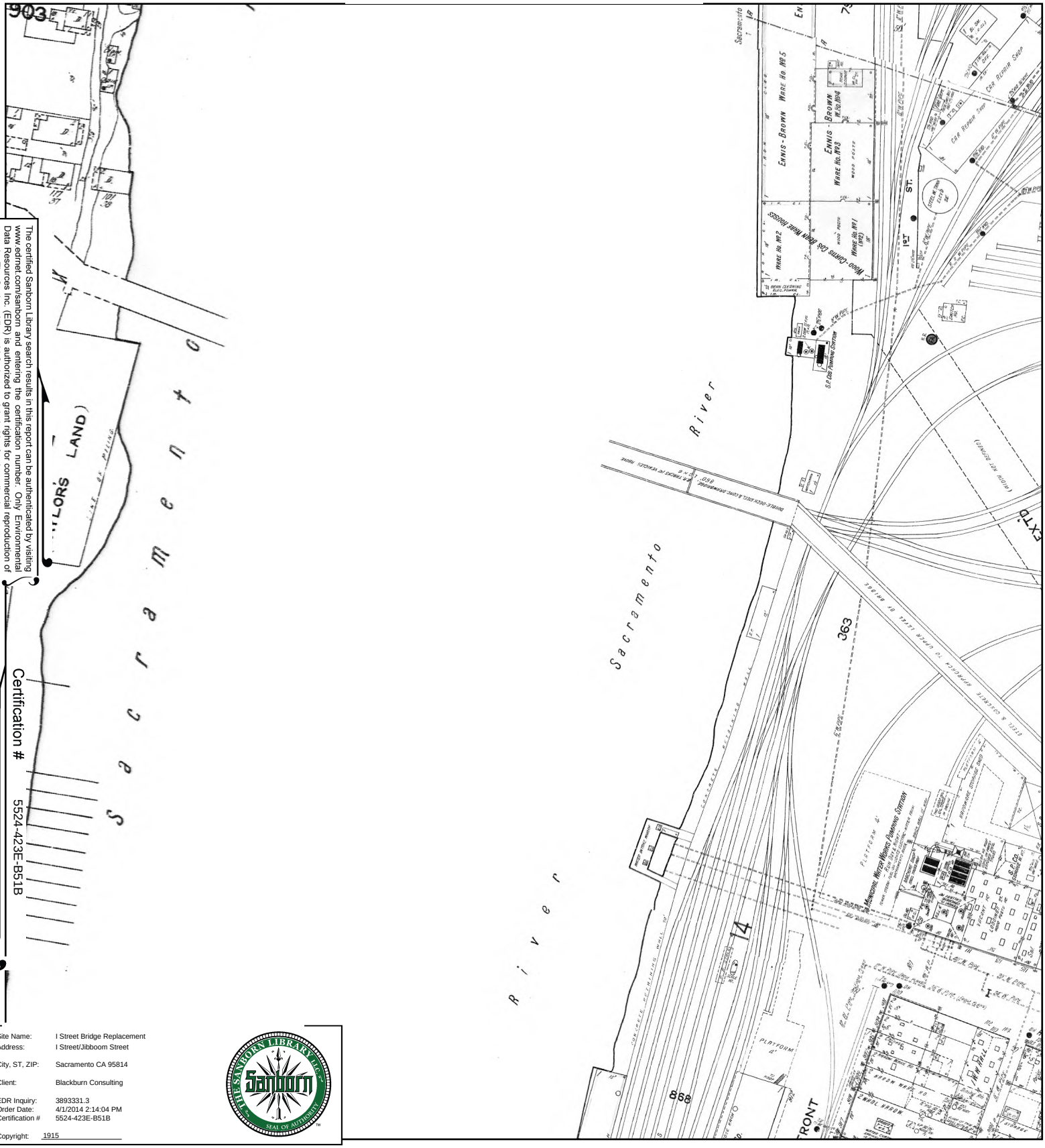
1915 Certified Sanborn Map



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Certification # 5524-423E-B51B

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B
Copyright: 1915

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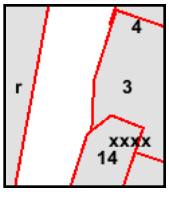

Volume 1, Sheet xxxx
Volume 1, Sheet 3
Volume 1, Sheet 14
Volume 1, Sheet r

0 Feet 165 330 660

N

1915 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification #: 5524-423E-B51B
Copyright: 1915

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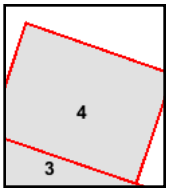


Volume 1, Sheet 4
Volume 1, Sheet 3

1915 Certified Sanborn Map

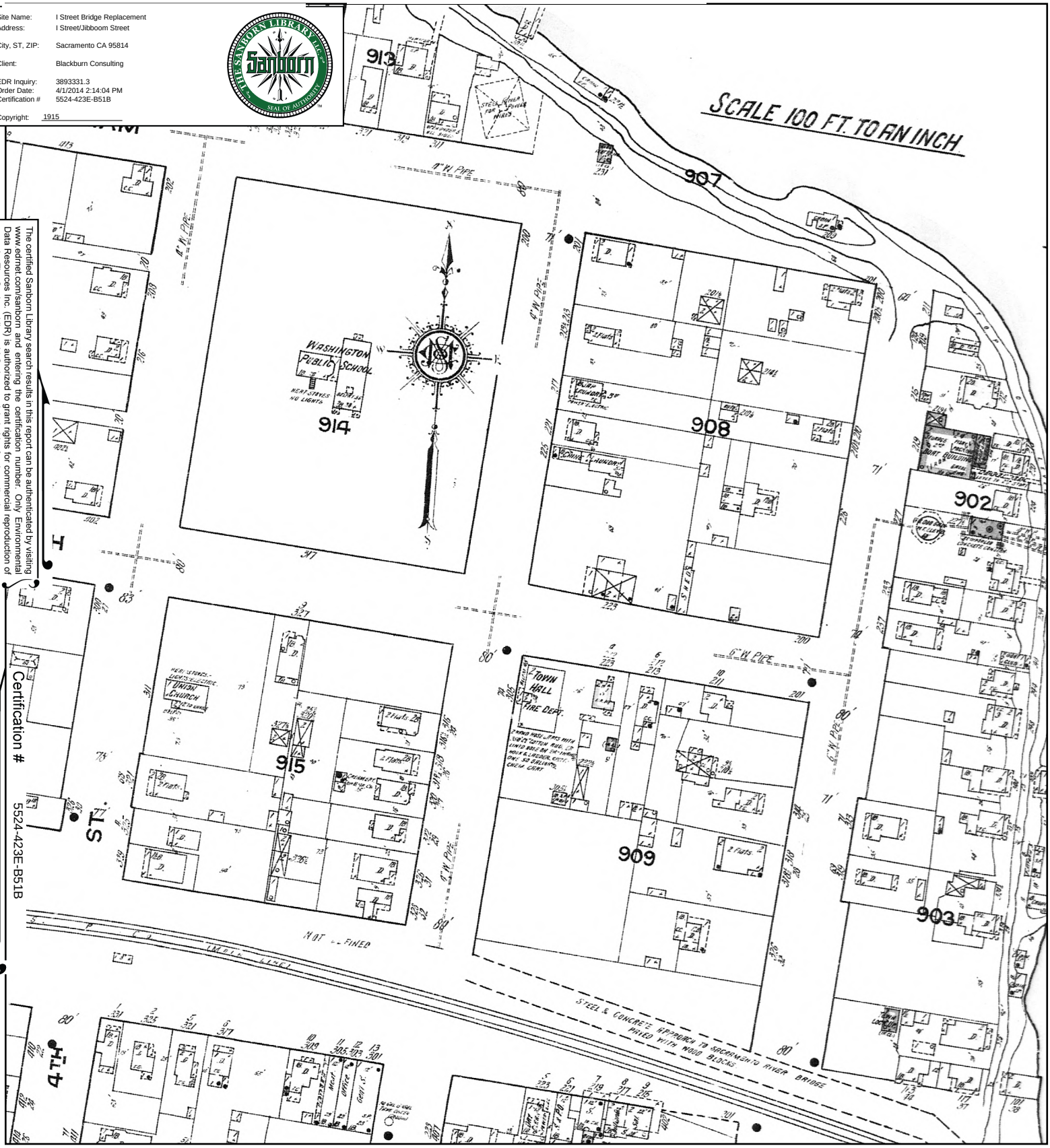
Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street

City, ST, ZIP: Sacramento CA 95814

Client: Blackburn Consulting

EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification #: 5524-423E-B51B

Copyright: 1915



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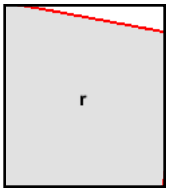

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0 Feet 165 330 660

N

1915 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street

City, ST, ZIP: Sacramento CA 95814

Client: Blackburn Consulting

EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B

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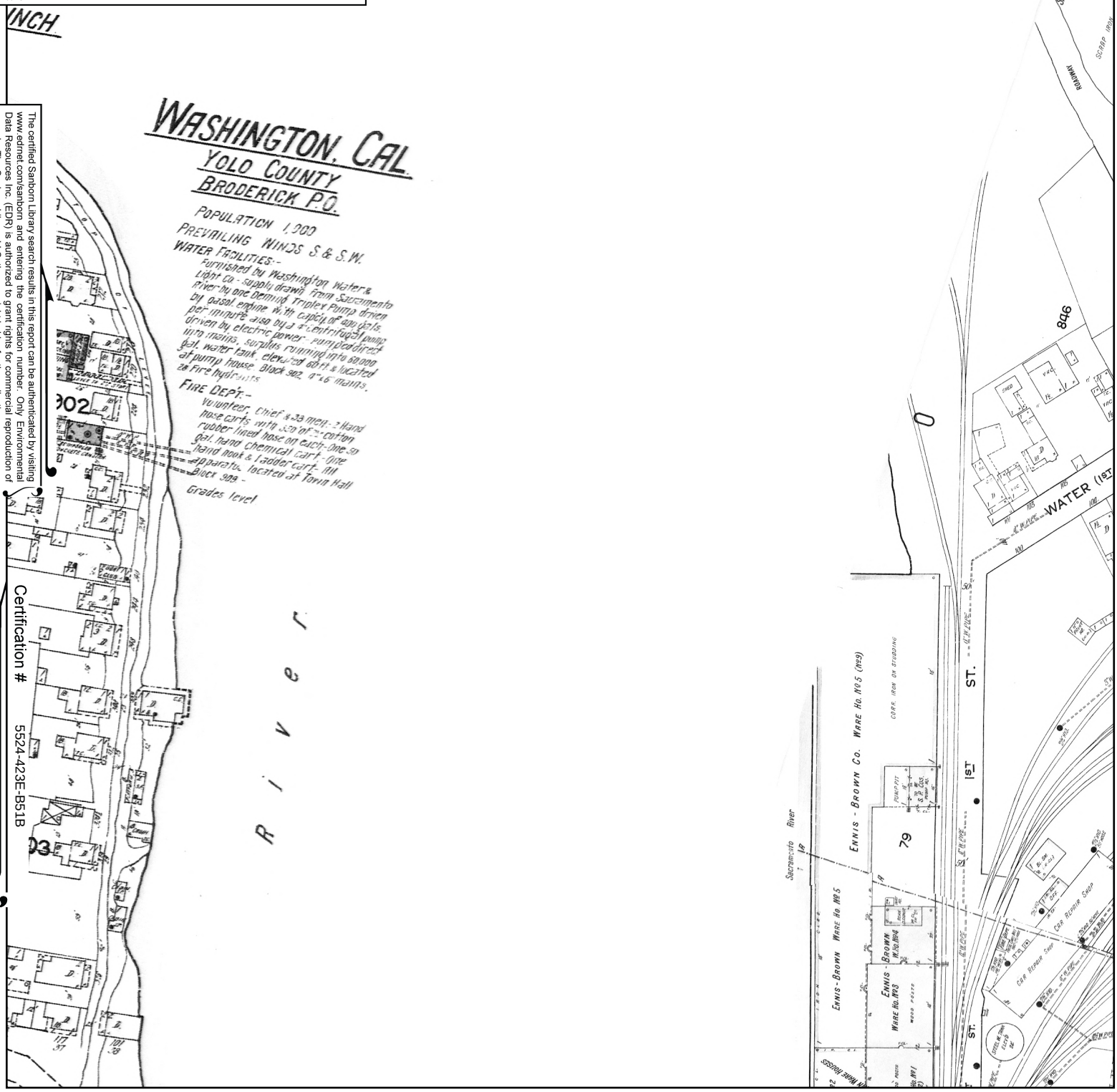

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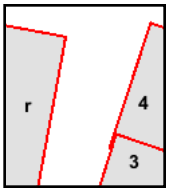

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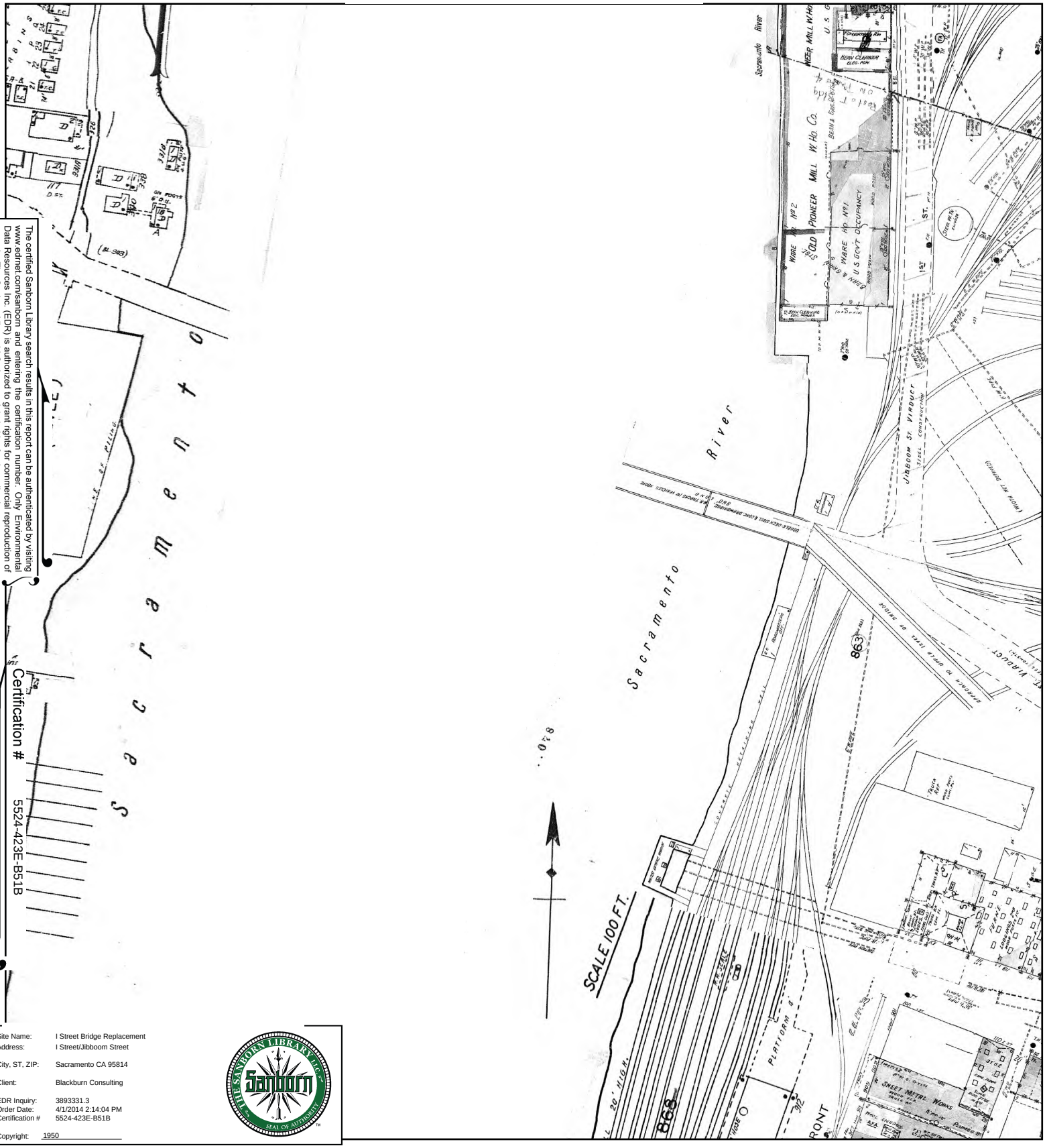
Volume 1, Sheet 3
Volume 1, Sheet r

0 Feet 165 330 660

N

1950 Certified Sanborn Map



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Certification # 5524-423E-B51B

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B
Copyright: 1950

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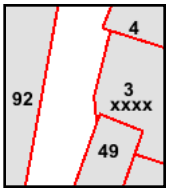

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Volume 1, Sheet 3
Volume 1, Sheet 4
Volume 1, Sheet 49
Volume 1, Sheet 92

0 Feet 165 330 660

N

1950 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street

City, ST, ZIP: Sacramento CA 95814

Client: Blackburn Consulting

EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
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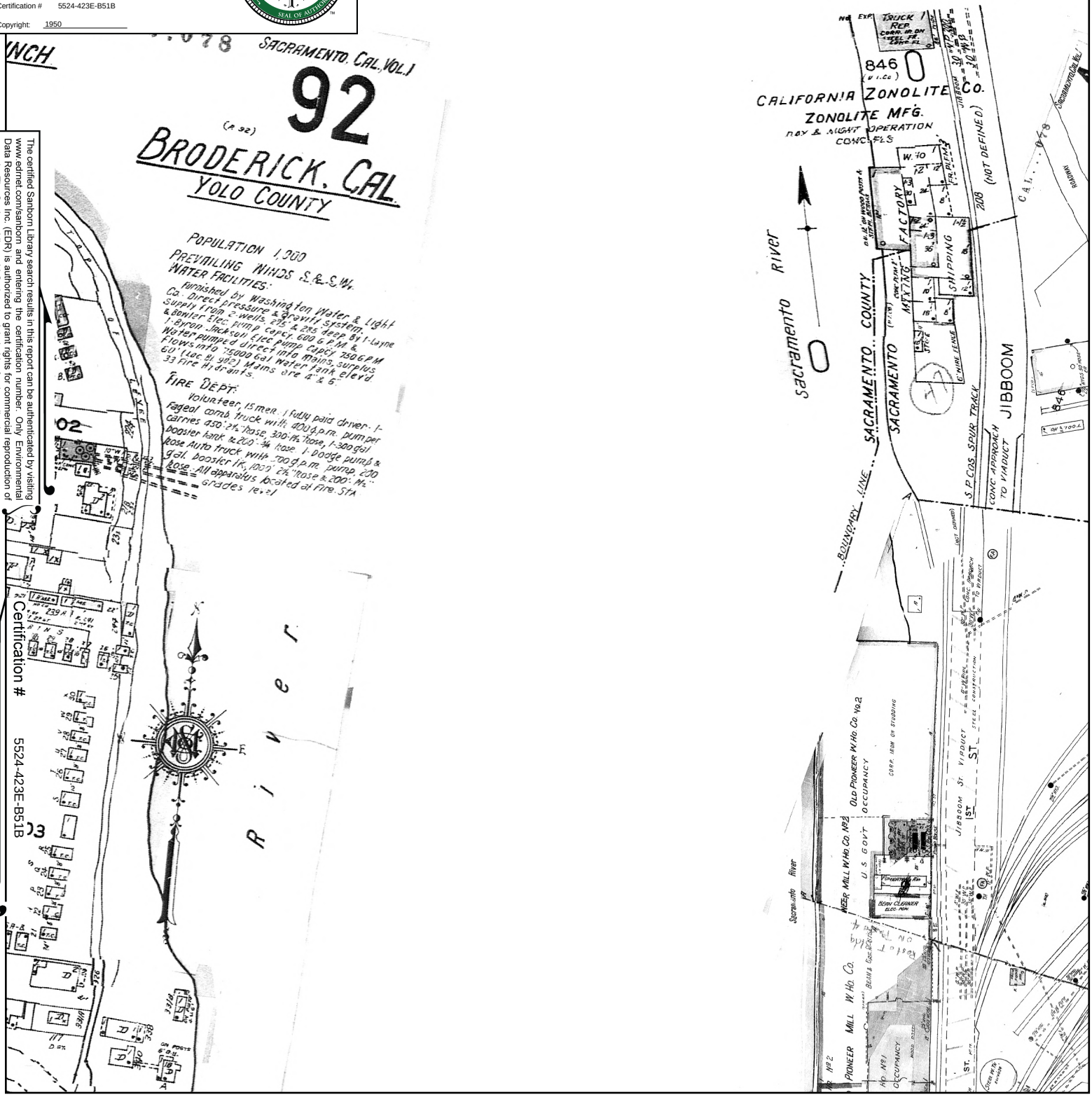

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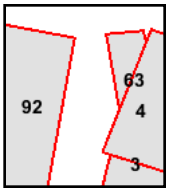

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Volume 1, Sheet 3
Volume 1, Sheet 4
Volume 1, Sheet 92

0 Feet 165 330 660

N

1950 Certified Sanborn Map

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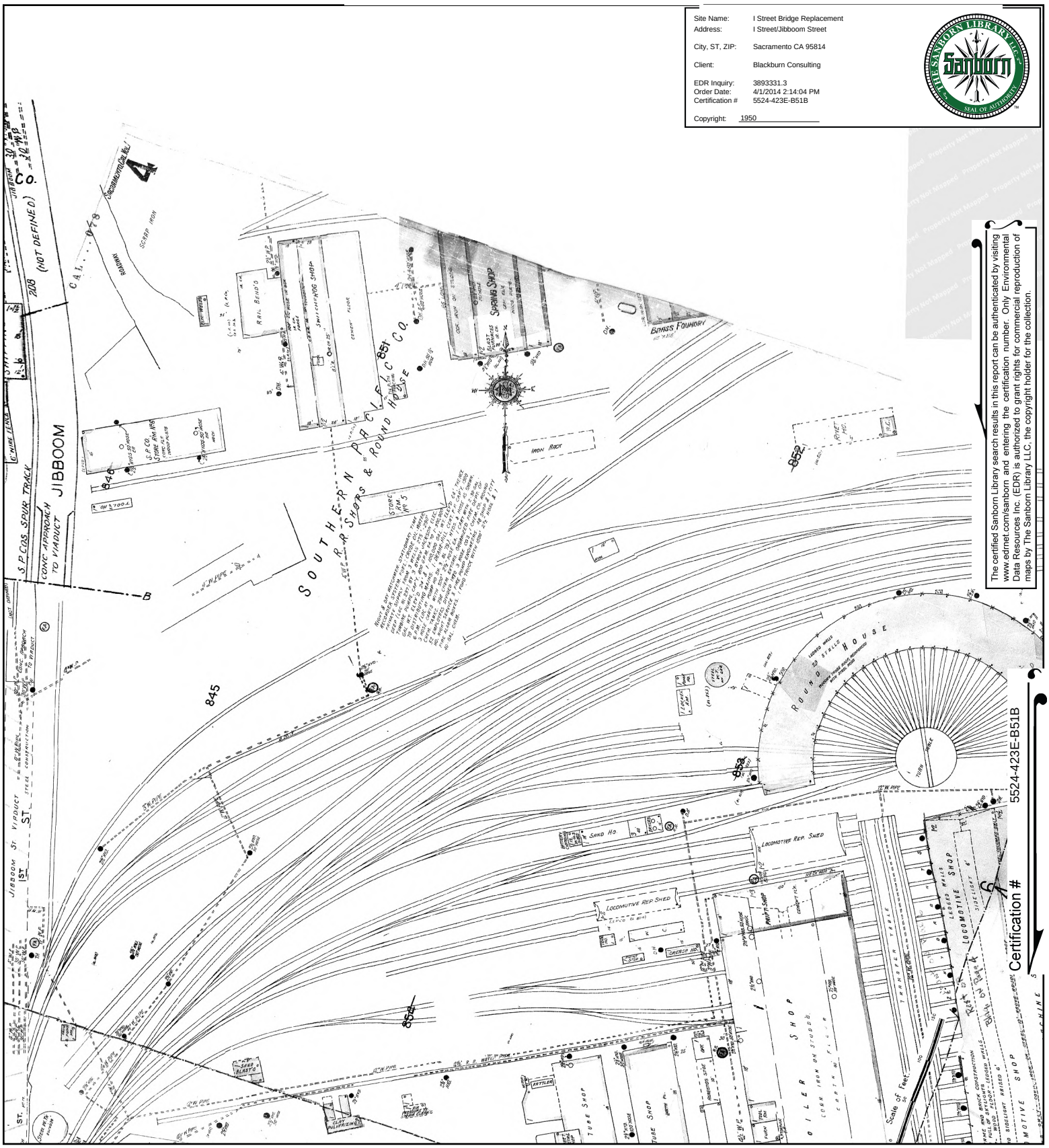

Certification # 5524-423E-B51B

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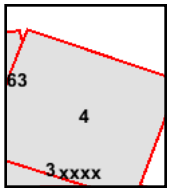

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Volume 1, Sheet 3
Volume 1, Sheet 4

N

1950 Certified Sanborn Map

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Address: I Street/Jibboom Street

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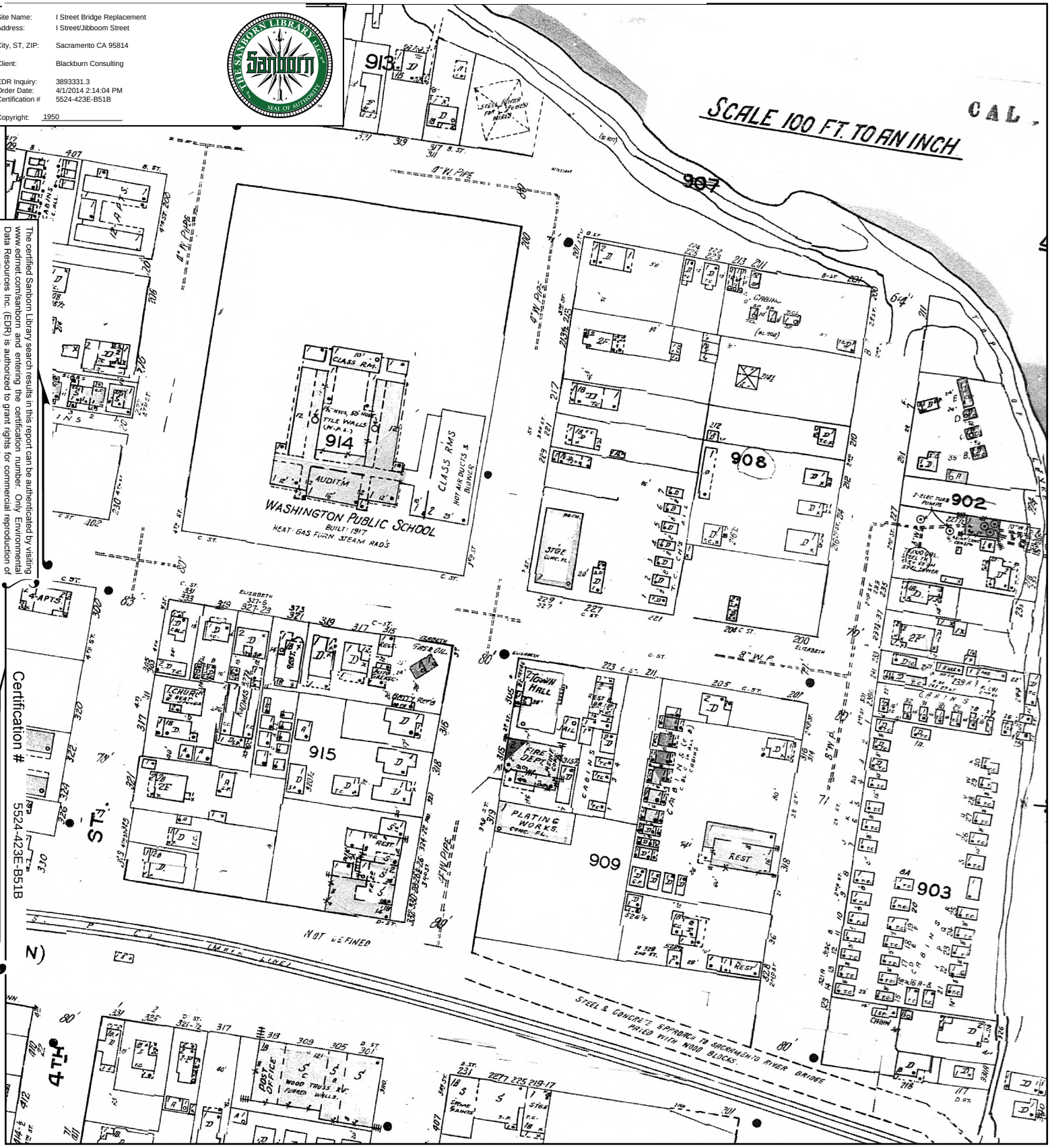

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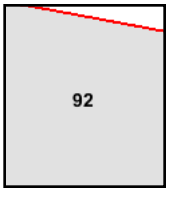

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1952 Certified Sanborn Map

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Certification # 5524-423E-B51B

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B
Copyright: 1952

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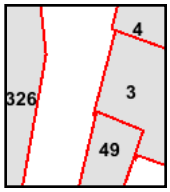

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Volume 1, Sheet 49

0 Feet 165 330 660

N

1952 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B
Copyright: 1952

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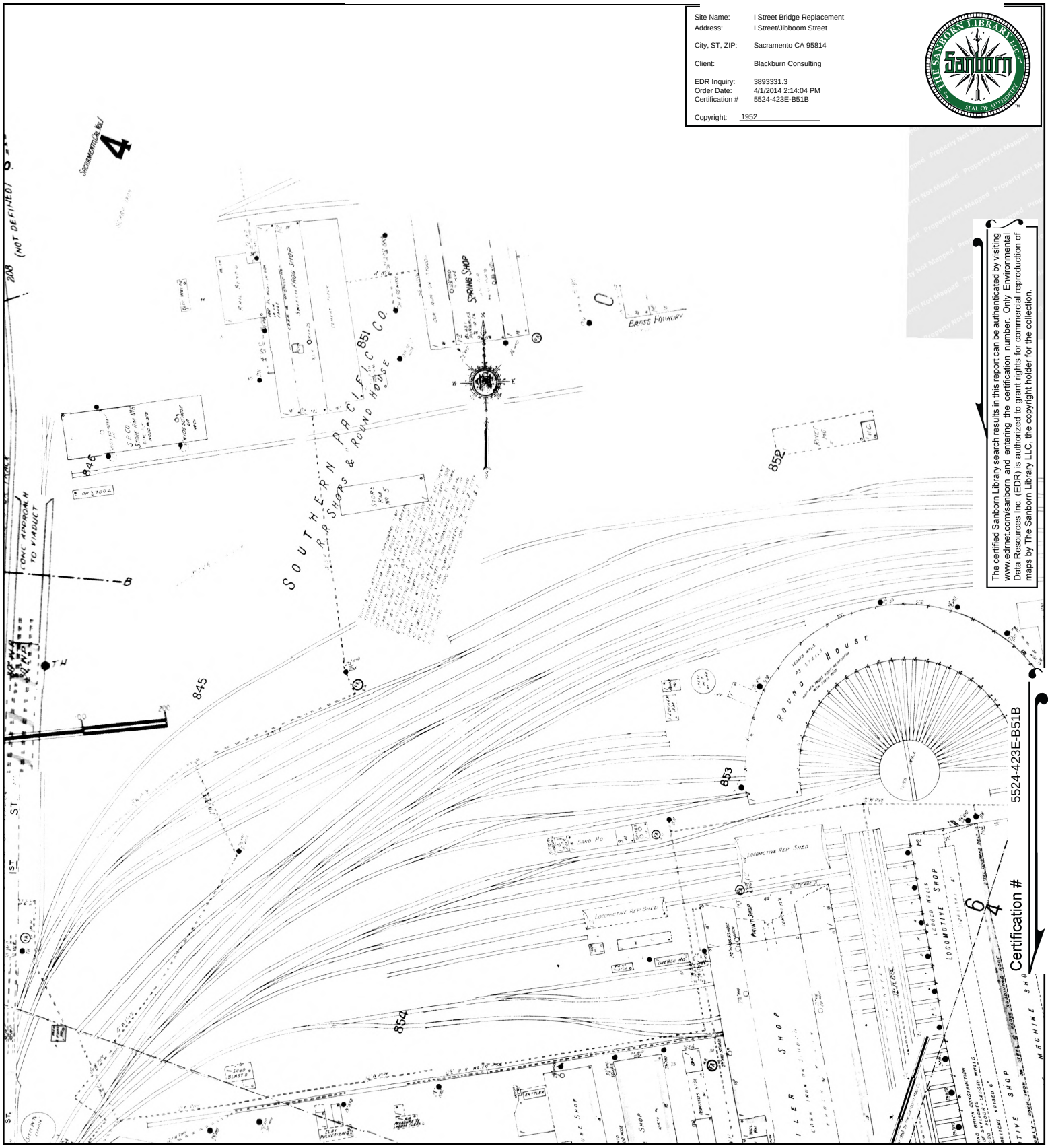

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Certification #

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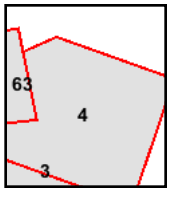

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N

1952 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street

City, ST, ZIP: Sacramento CA 95814

Client: Blackburn Consulting

EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification #: 5524-423E-B51B

Copyright: 1952

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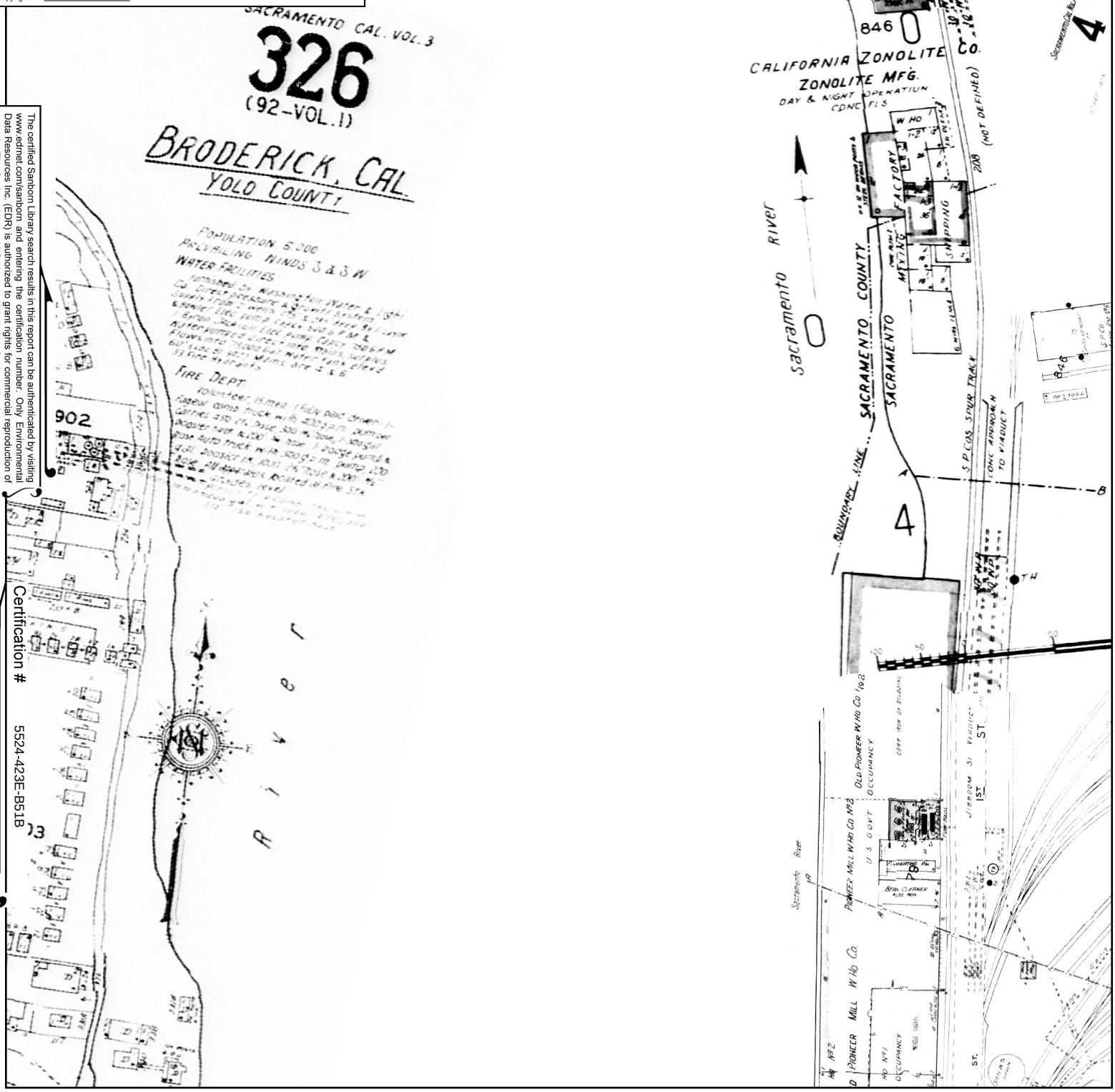
Certification # 5524-423E-B51B



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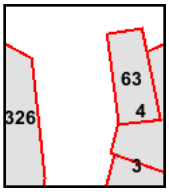

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Volume 1, Sheet 4
Volume 1, Sheet 63

0 Feet 165 330 660

N

1952 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street

City, ST, ZIP: Sacramento CA 95814

Client: Blackburn Consulting

EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B

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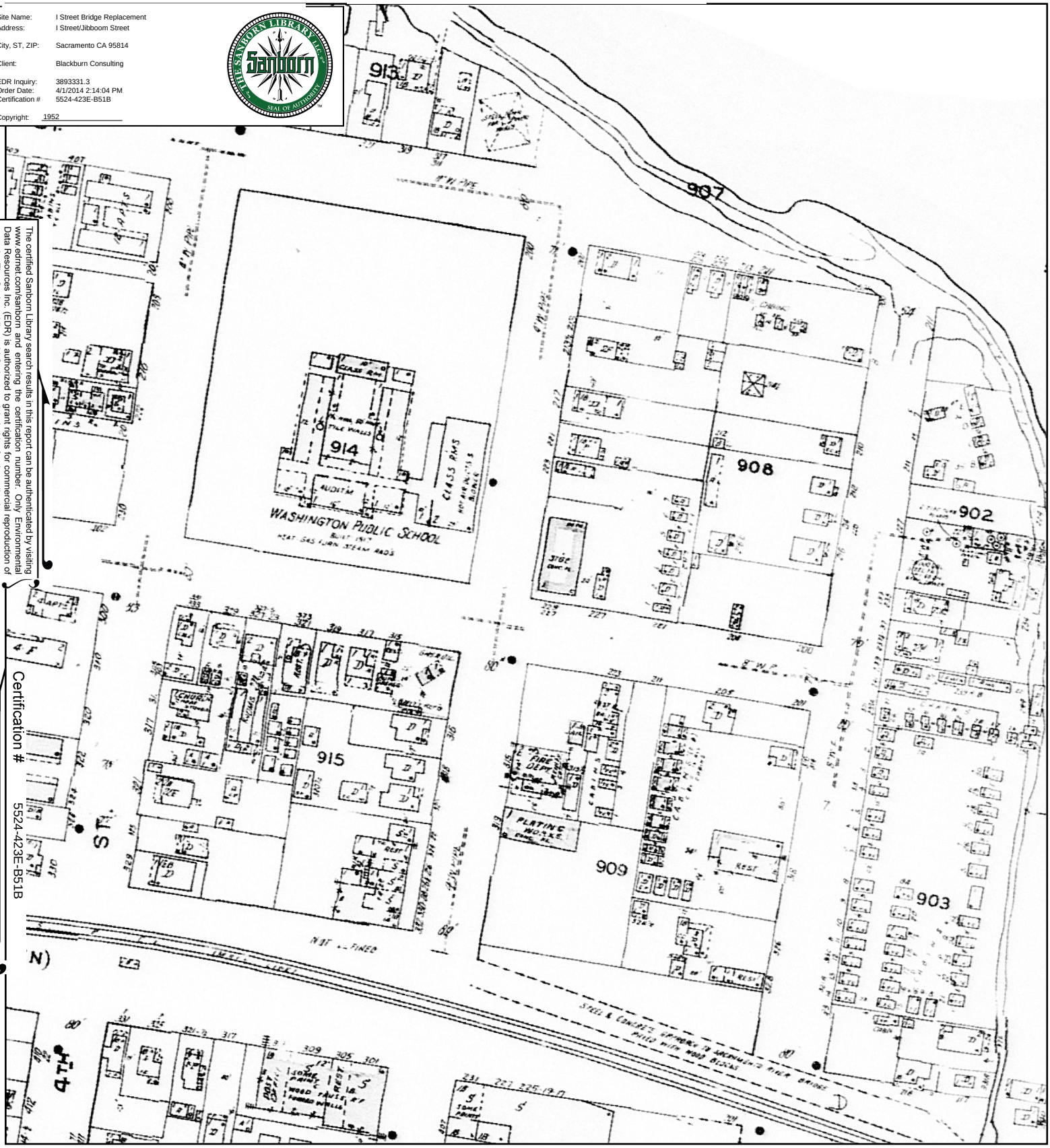
Certification # 5524-423E-B51B



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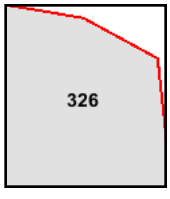

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N

1957 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B
Copyright: 1957

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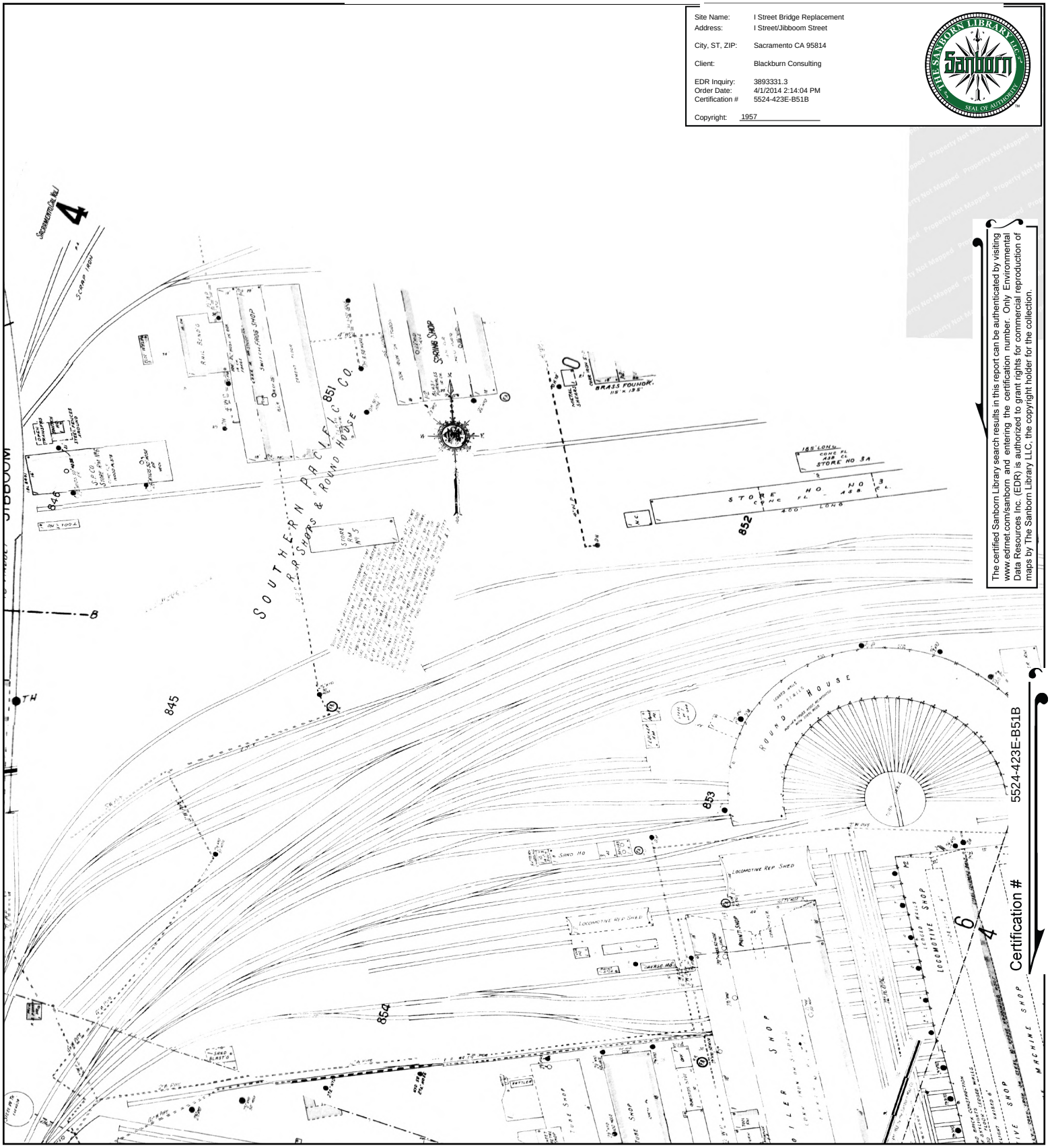

Certification # 5524-423E-B51B

This Certified Sanborn Map combines the following sheets.
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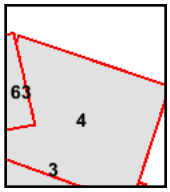

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Volume 1, Sheet 63

N

1957 Certified Sanborn Map

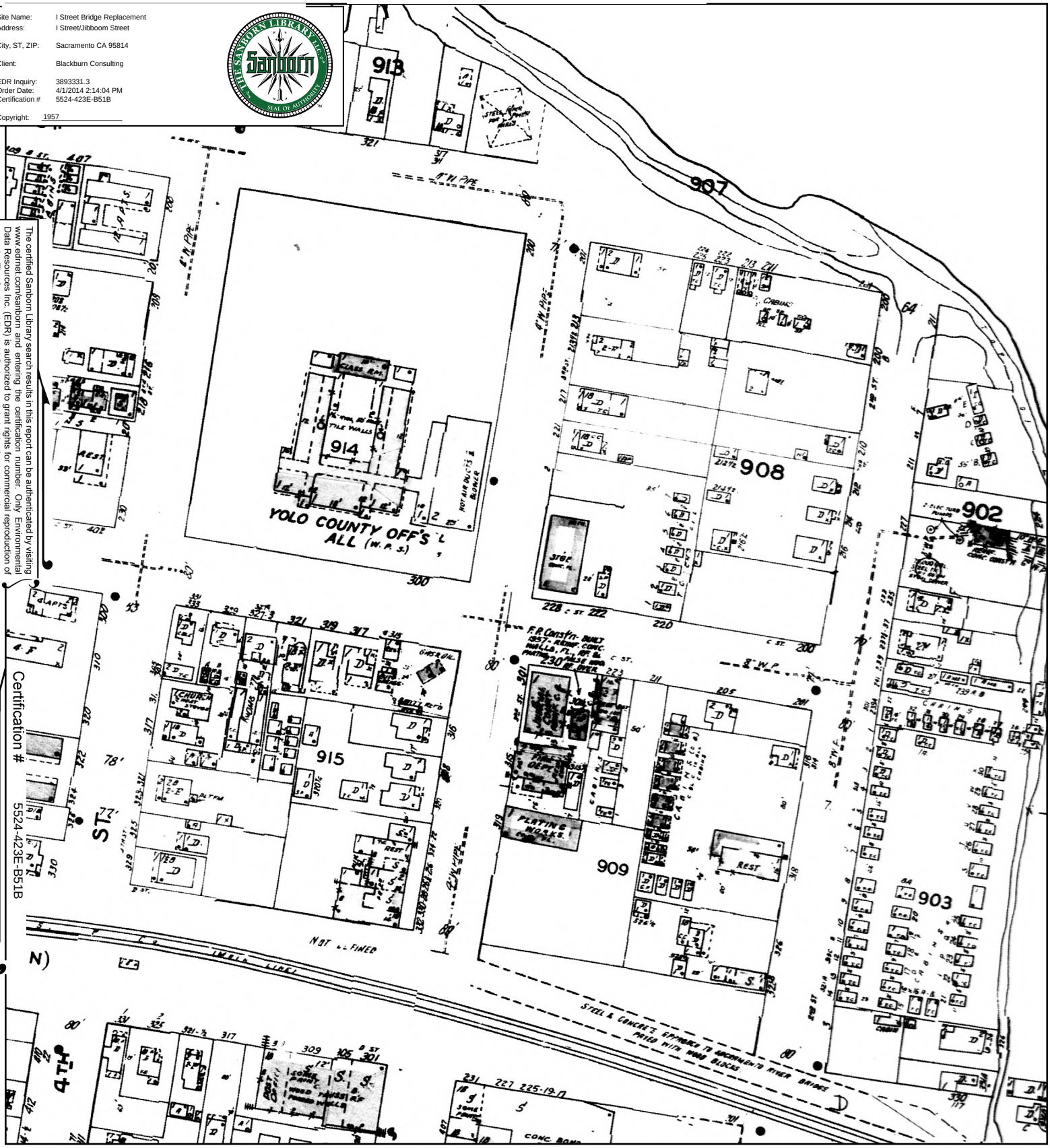
Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street

City, ST, ZIP: Sacramento CA 95814

Client: Blackburn Consulting

EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B

Copyright: 1957



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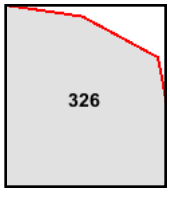

Volume 3, Sheet 326

N

1957 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification #: 5524-423E-B51B
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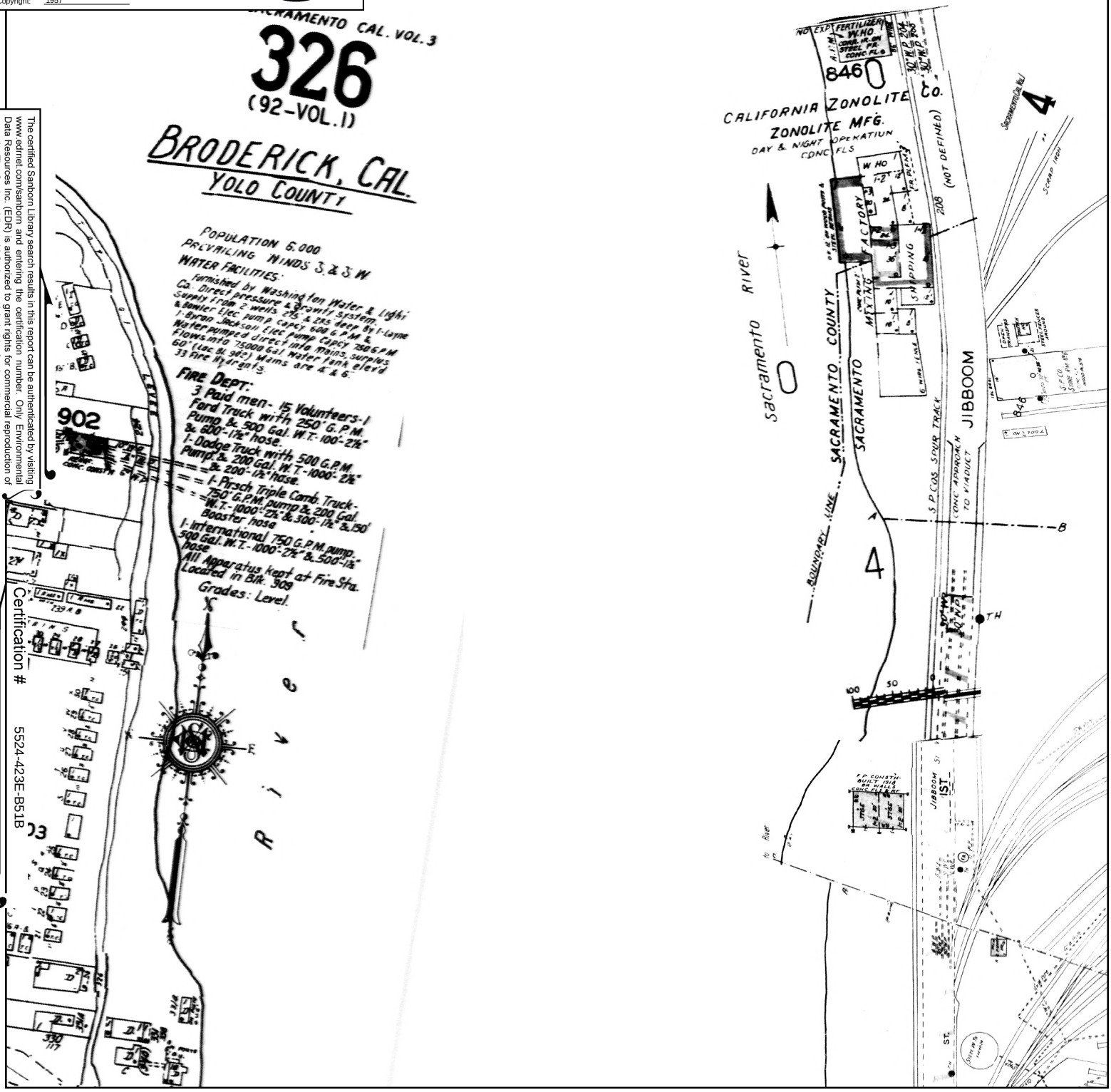

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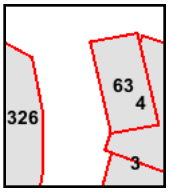

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Volume 1, Sheet 4
Volume 1, Sheet 63
Volume 3, Sheet 326

0 Feet 165 330 660

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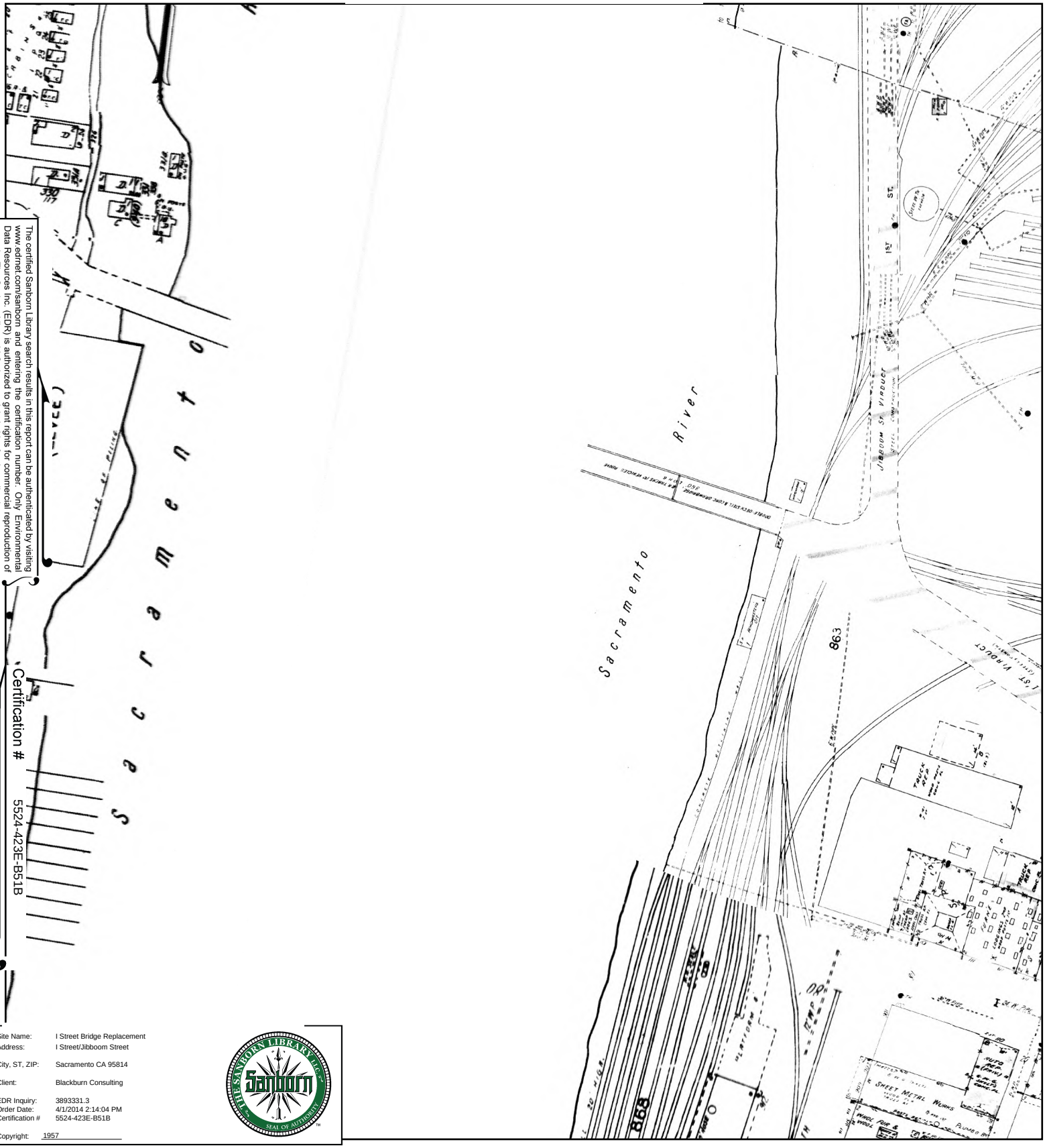
1957 Certified Sanborn Map



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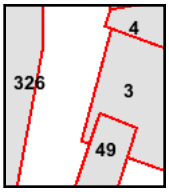

Volume 1, Sheet 3
Volume 1, Sheet 49
Volume 3, Sheet 326

0 Feet 165 330 660

N

1960 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street

City, ST, ZIP: Sacramento CA 95814

Client: Blackburn Consulting

EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B

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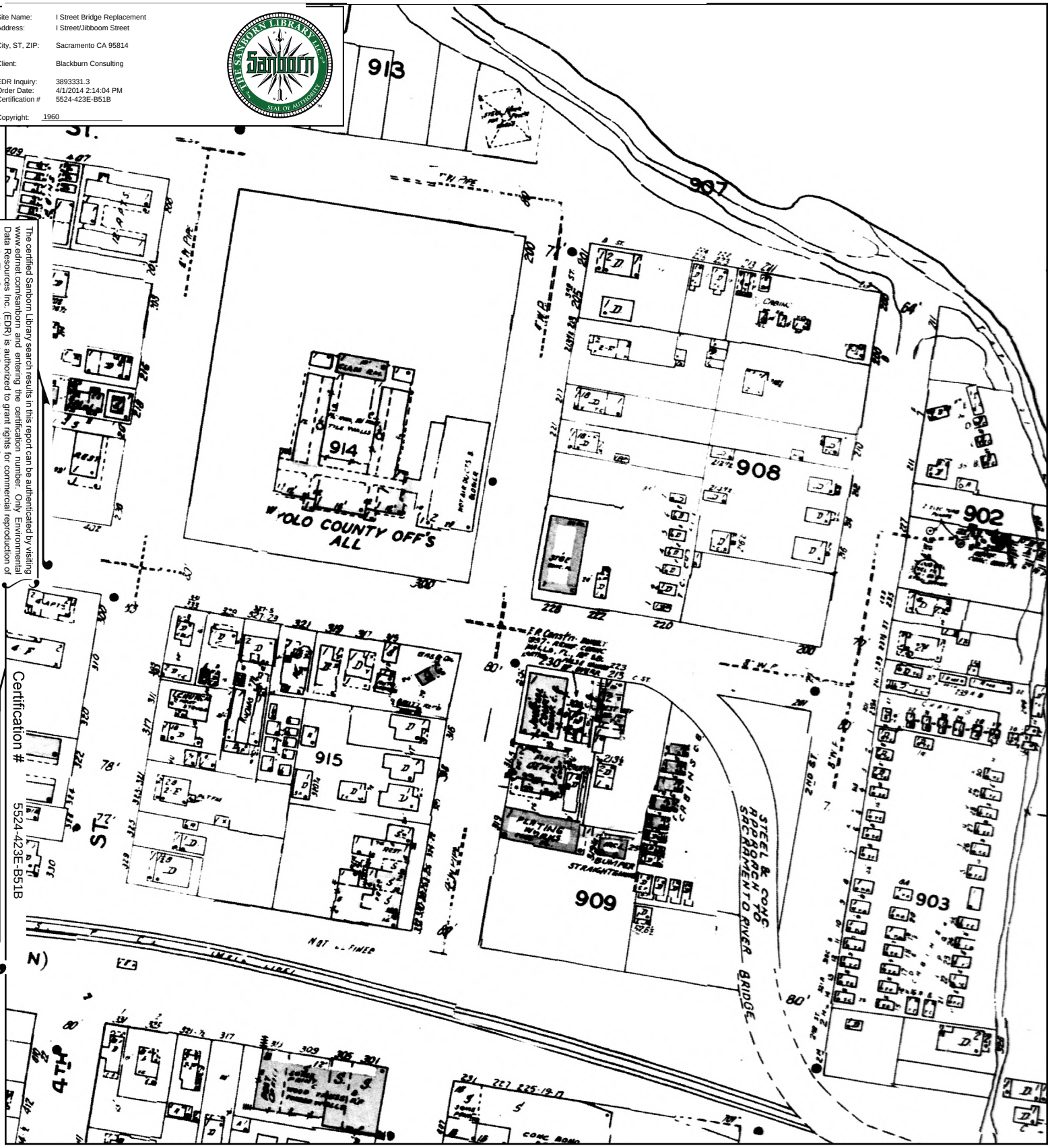

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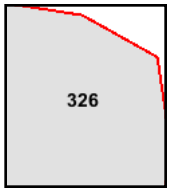

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1960 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification #: 5524-423E-B51B
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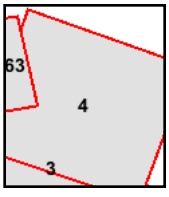

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1960 Certified Sanborn Map

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Certification # 5524-423E-B51B

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Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B
Copyright: 1960

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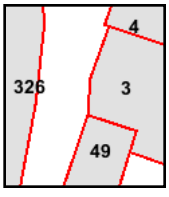

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Volume 1, Sheet 3
Volume 1, Sheet 49

0 Feet 165 330 660

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1960 Certified Sanborn Map

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Certification #: 5524-423E-B51B
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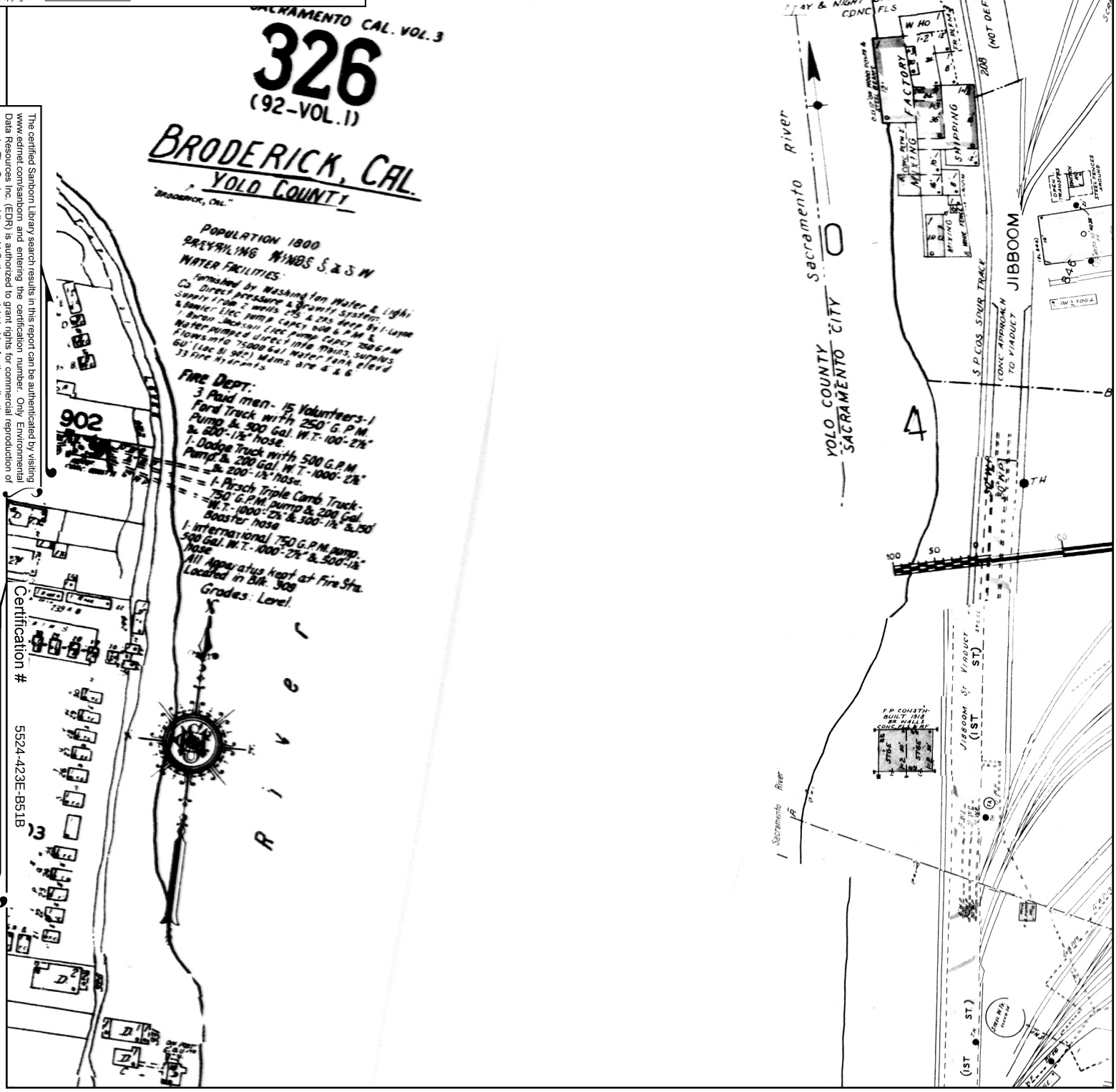

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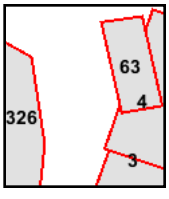

Volume 3, Sheet 326
Volume 1, Sheet 3
Volume 1, Sheet 4
Volume 1, Sheet 63

0 Feet 165 330 660

N

1964 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street

City, ST, ZIP: Sacramento CA 95814

Client: Blackburn Consulting

EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
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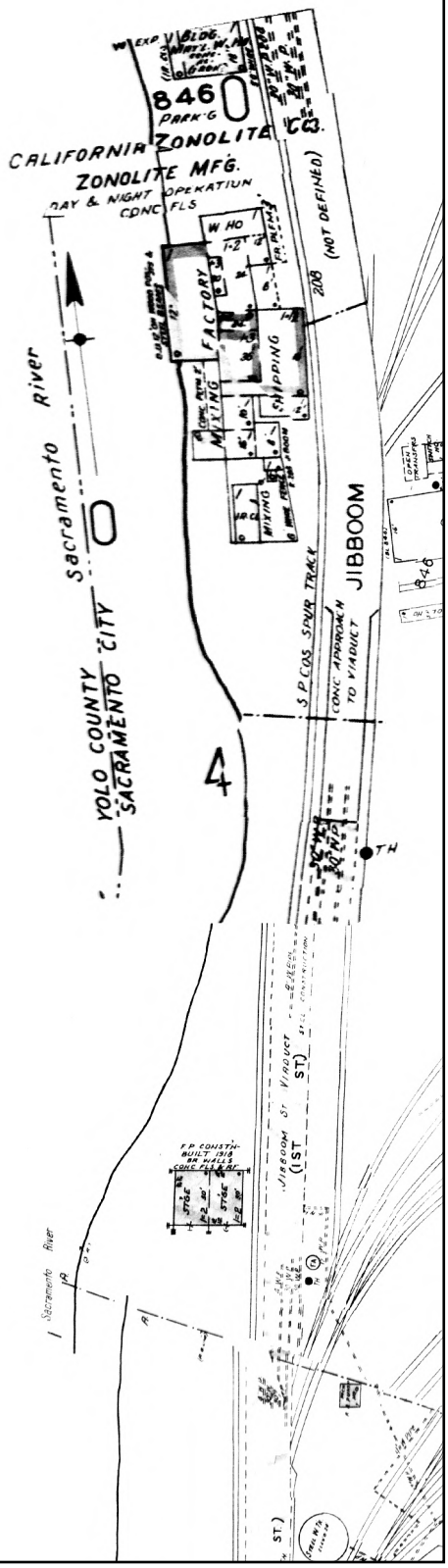

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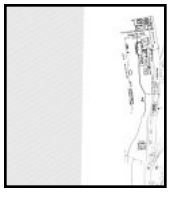

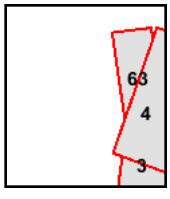

Volume 1, Sheet 63
Volume 1, Sheet 4
Volume 1, Sheet 3

0 Feet 165 330 660

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1964 Certified Sanborn Map

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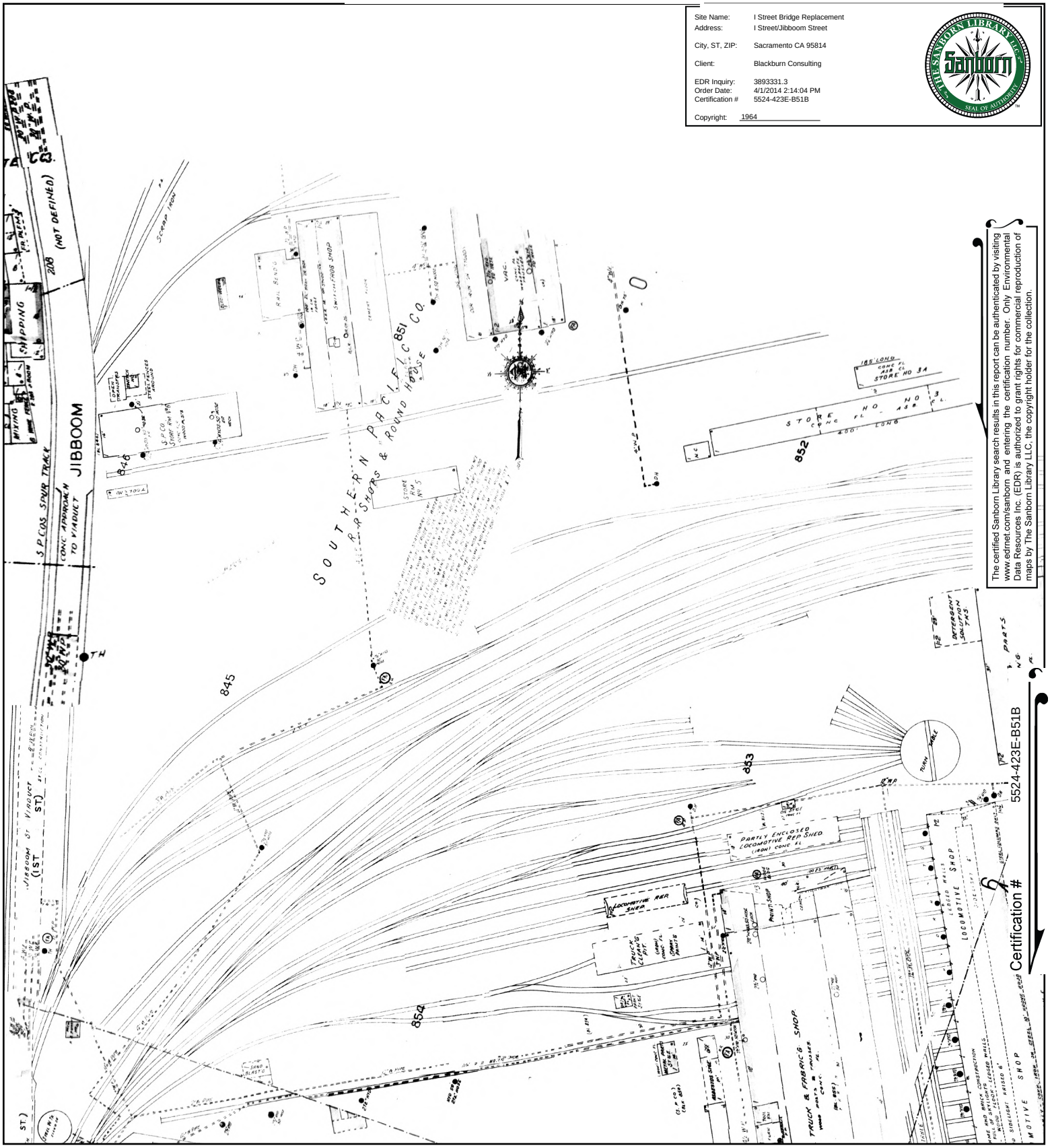

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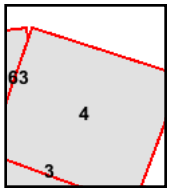
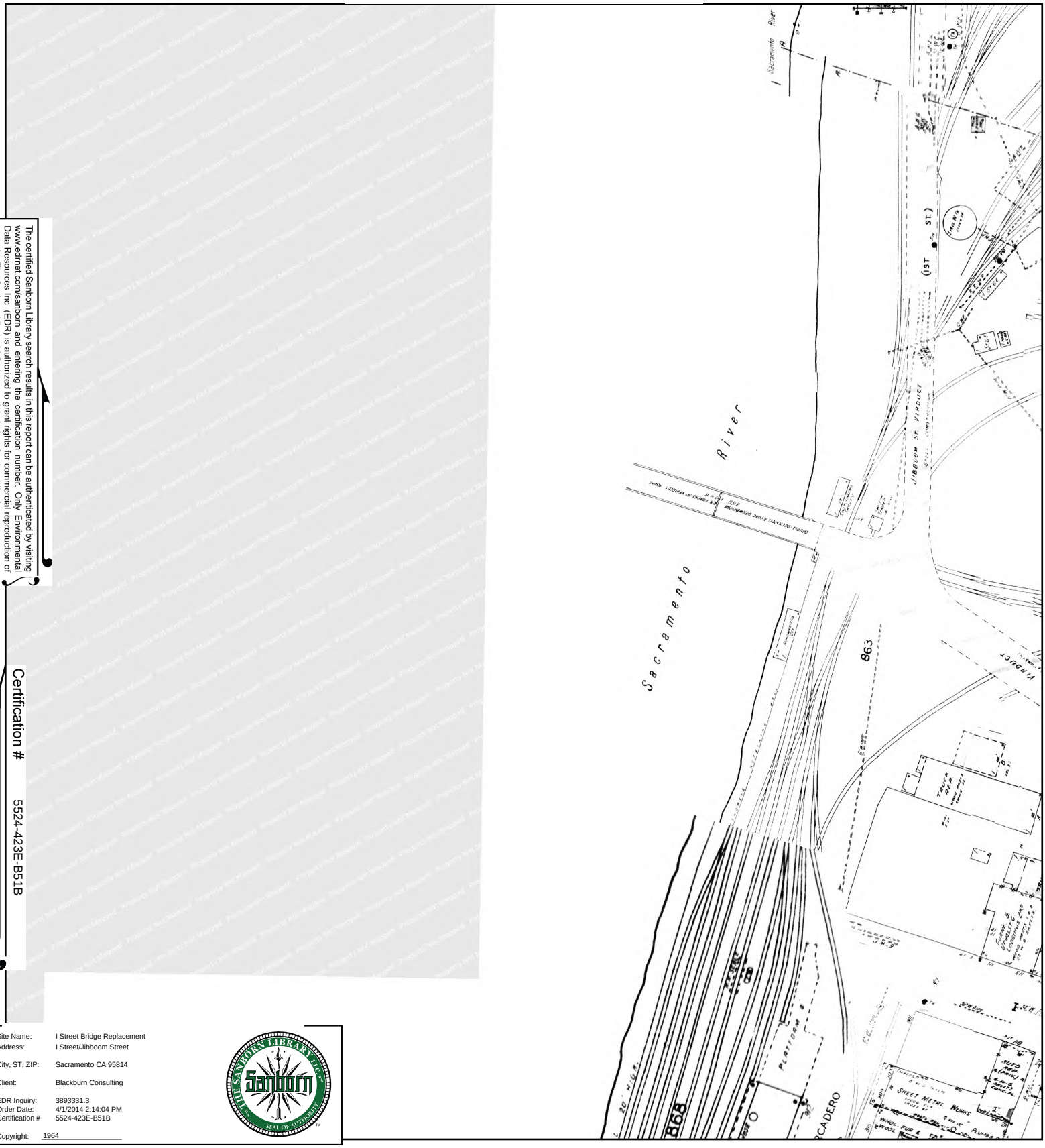


Volume 1, Sheet 63
Volume 1, Sheet 3
Volume 1, Sheet 4

N

1964 Certified Sanborn Map



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Certification # 5524-423E-B51B

Site Name: I Street Bridge Replacement
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EDR Inquiry: 3893331.3
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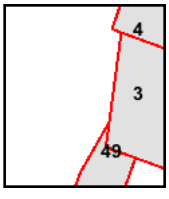

Volume 1, Sheet 49
Volume 1, Sheet 3

0 Feet 165 330 660

N

1965 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
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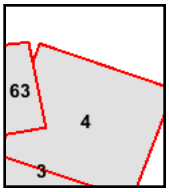

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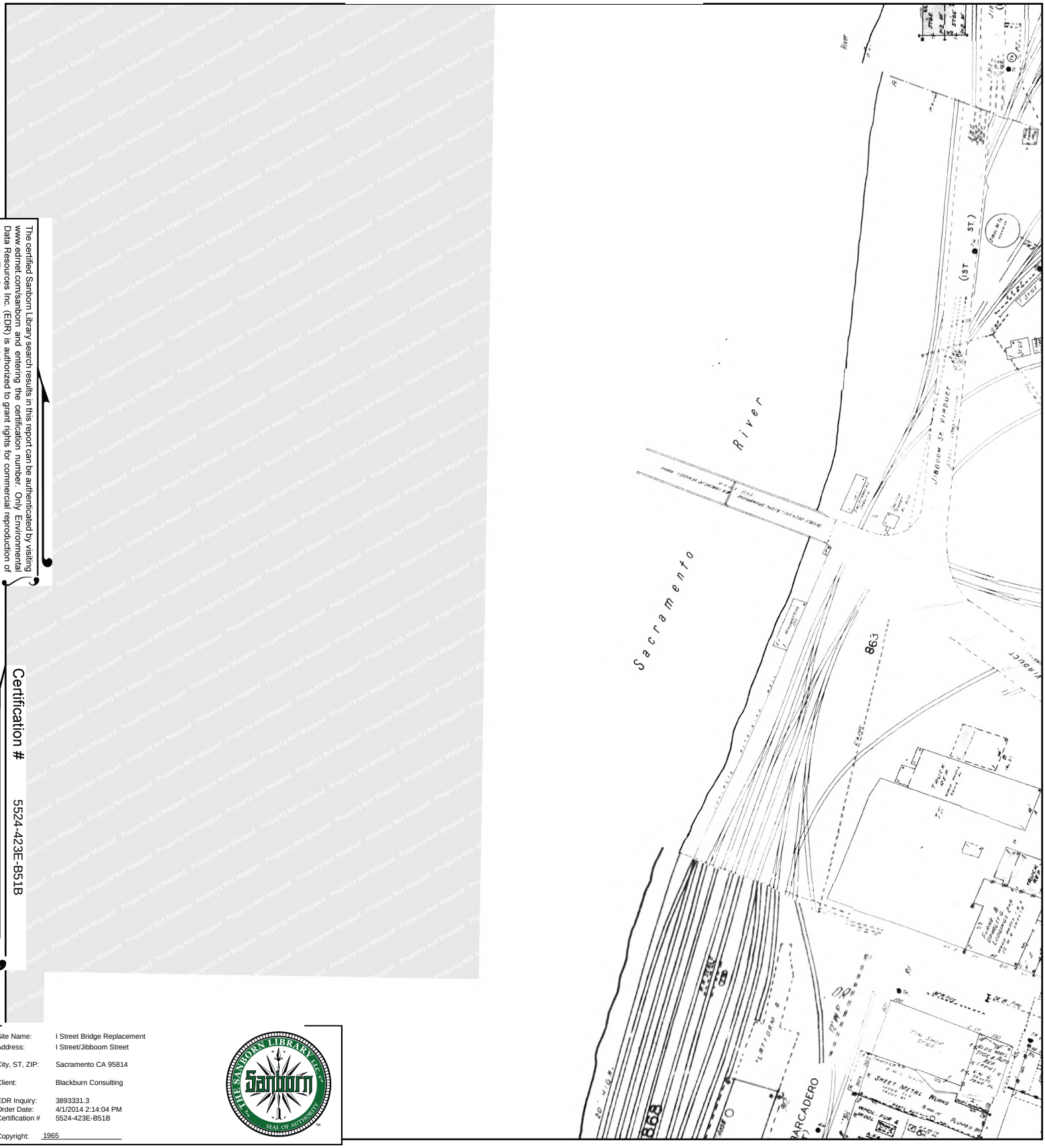
N

1965 Certified Sanborn Map



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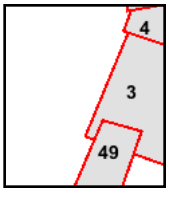

Volume 1, Sheet 3
Volume 1, Sheet 49

0 Feet 165 330 660

N

1965 Certified Sanborn Map

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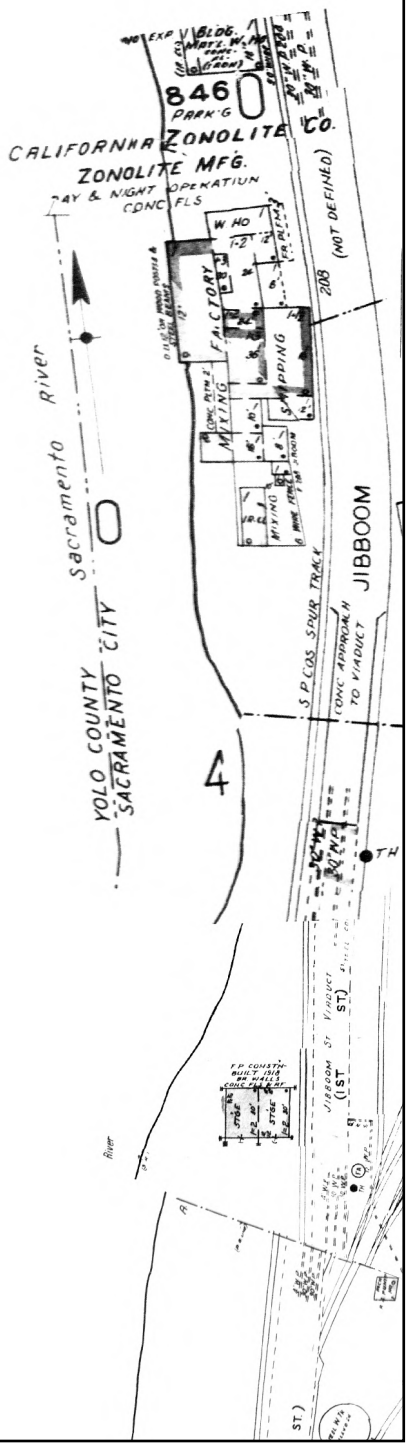

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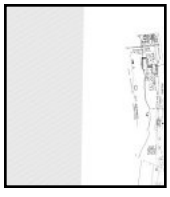

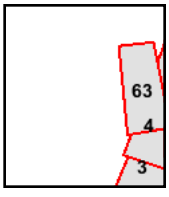

Volume 1, Sheet 4
Volume 1, Sheet 63

0 Feet 165 330 660

N

1966 Certified Sanborn Map

Site Name: I Street Bridge Replacement
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City, ST, ZIP: Sacramento CA 95814

Client: Blackburn Consulting

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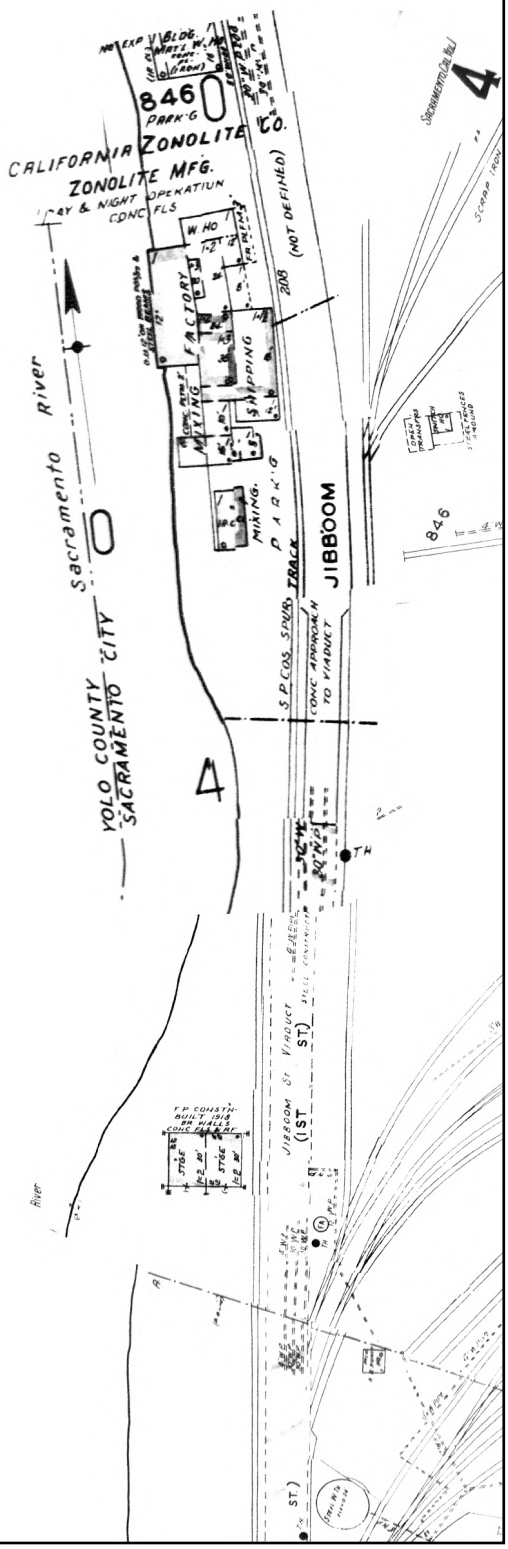

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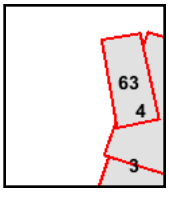

Volume 1, Sheet 3
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Volume 1, Sheet 63

0 Feet 165 330 660

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1966 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
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Client: Blackburn Consulting
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Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B
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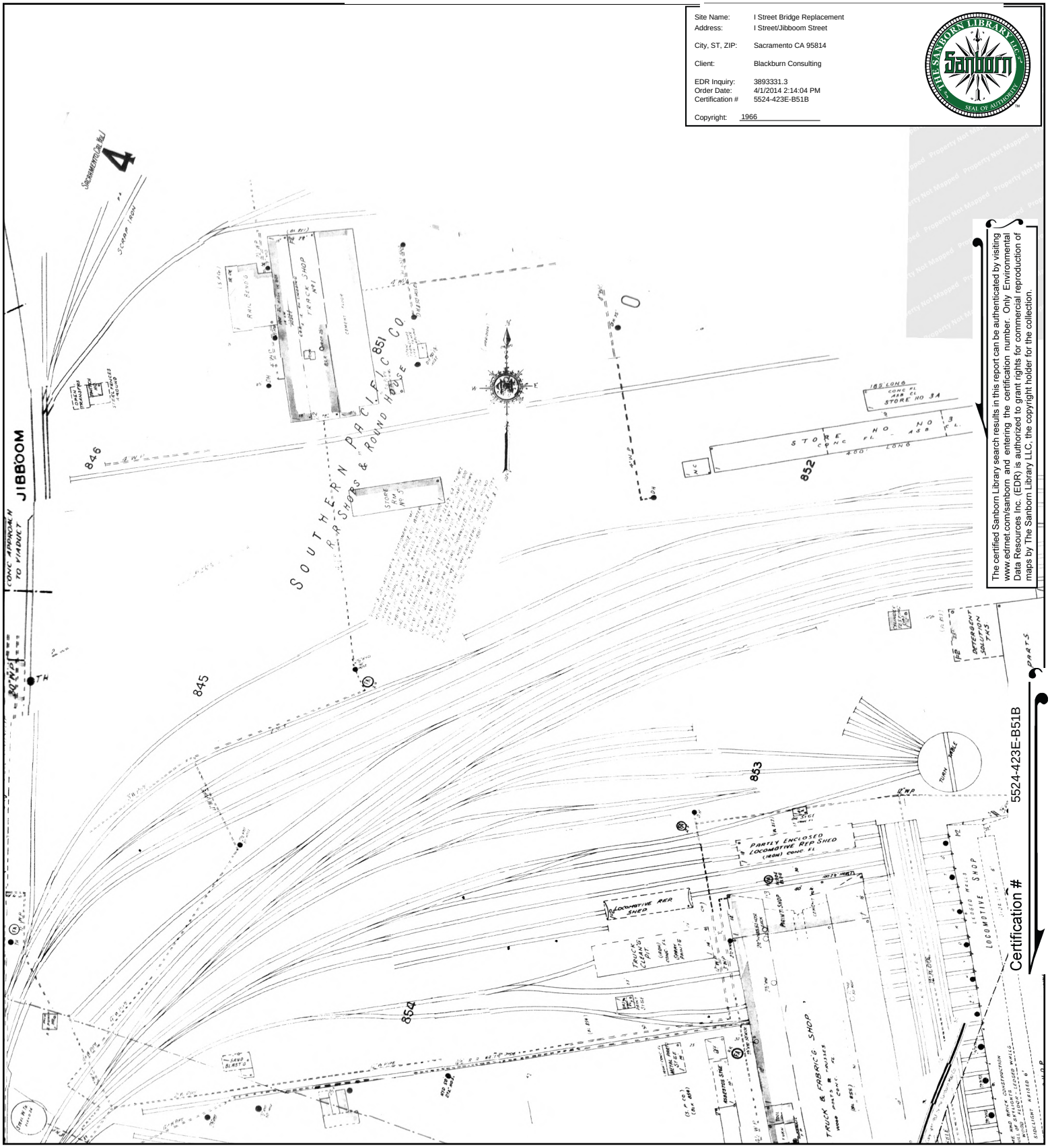

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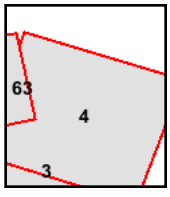

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Volume 1, Sheet 63

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1966 Certified Sanborn Map

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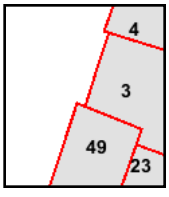


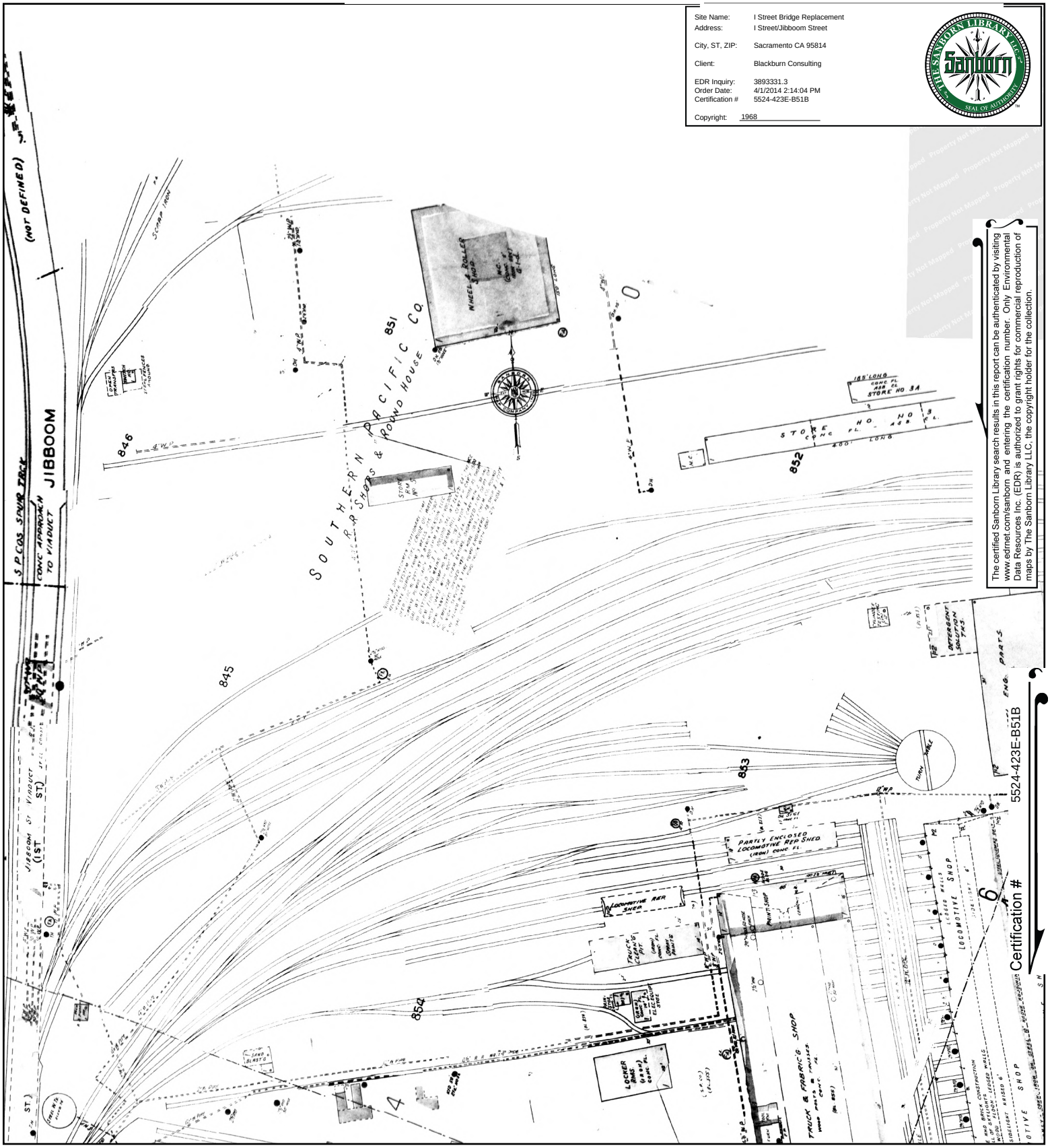
Volume 1, Sheet 3
Volume 1, Sheet 4
Volume 1, Sheet 23
Volume 1, Sheet 49

0 Feet 165 330 660

N

1968 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B
Copyright: 1968



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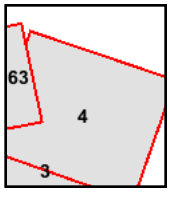

Volume 1, Sheet 4
Volume 1, Sheet 63

N

1968 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
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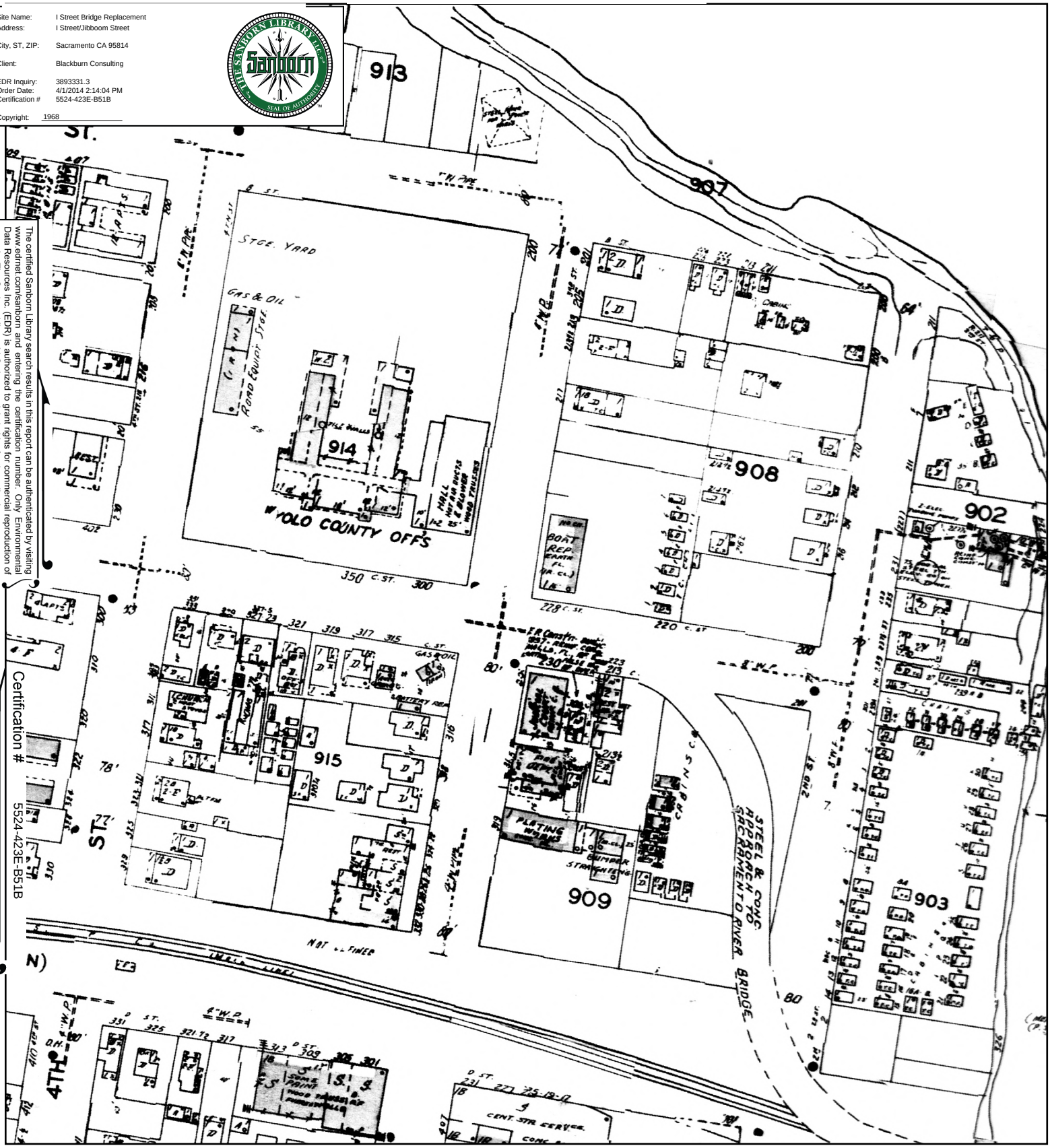

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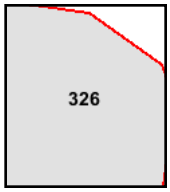

Volume 3, Sheet 326

N

1968 Certified Sanborn Map

Site Name: I Street Bridge Replacement
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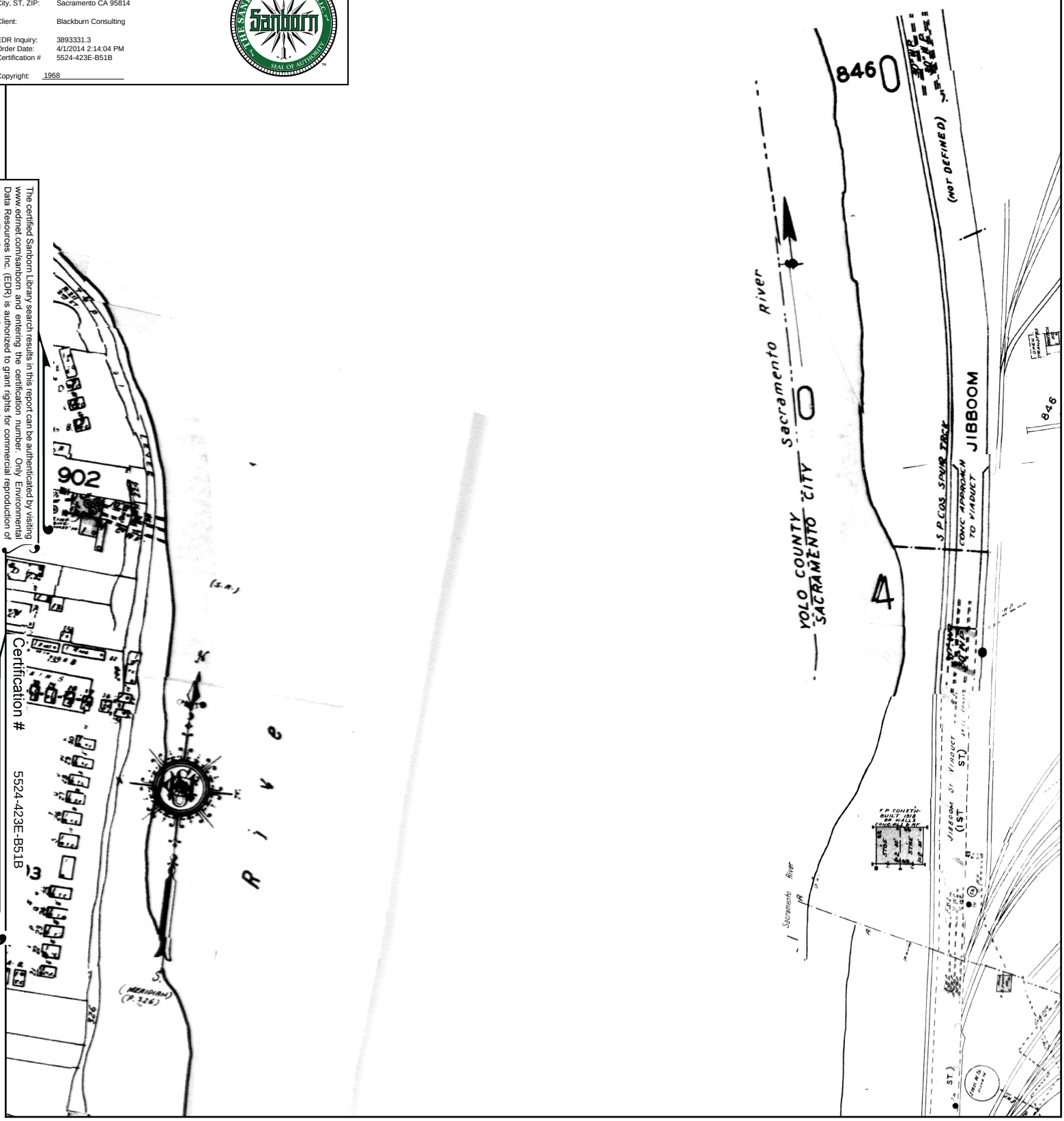

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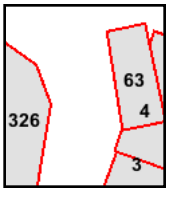

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Volume 1, Sheet 3
Volume 1, Sheet 4
Volume 1, Sheet 63

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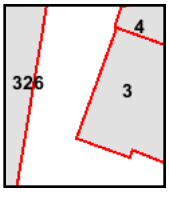

Volume 3, Sheet 326
Volume 1, Sheet 3

0 Feet 165 330 660

N

1970 Certified Sanborn Map

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Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B
Copyright: 1970

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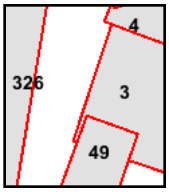


Volume 1, Sheet 3
Volume 1, Sheet 49
Volume 3, Sheet 326

0 Feet 165 330 660

N

1970 Certified Sanborn Map

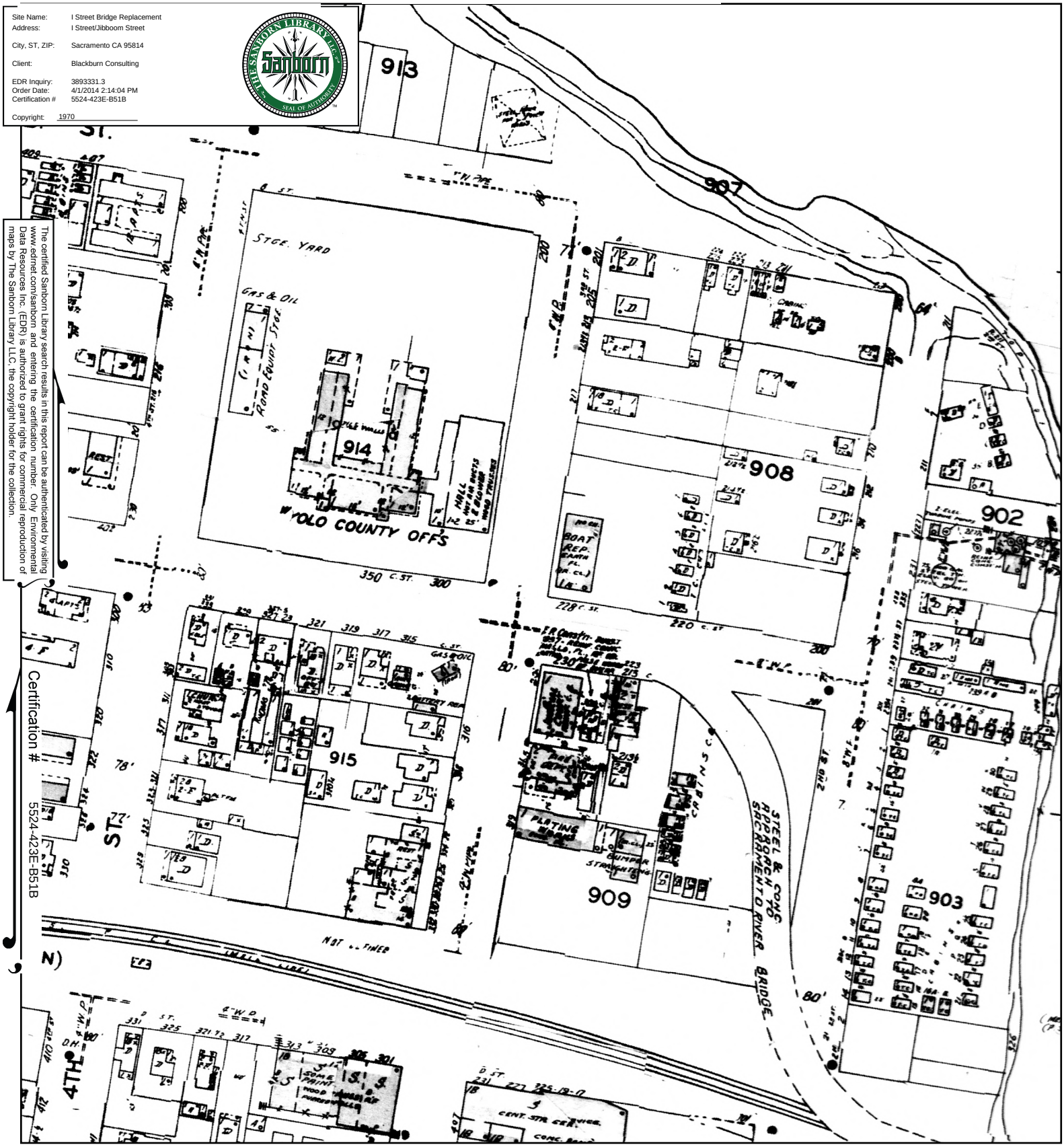
Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street

City, ST, ZIP: Sacramento CA 95814

Client: Blackburn Consulting

EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification # 5524-423E-B51B

Copyright: 1970



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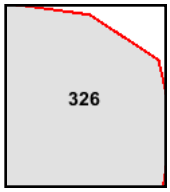

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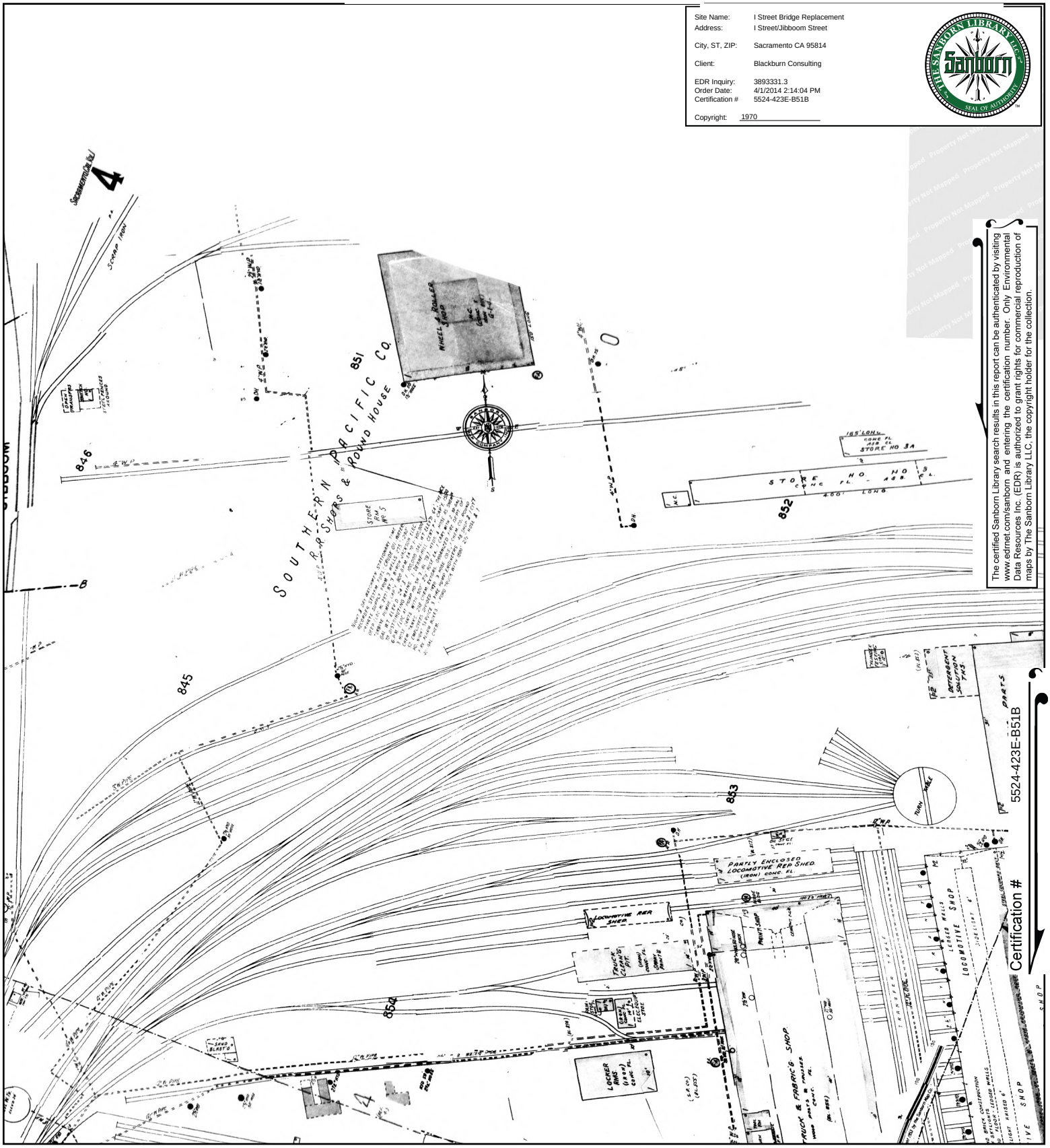

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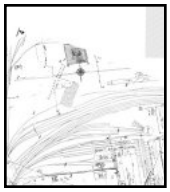
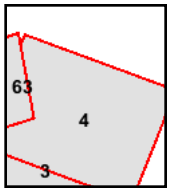
This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

0 Feet 165 330 660





Volume 1, Sheet 4
Volume 1, Sheet 63

1970 Certified Sanborn Map

Site Name: I Street Bridge Replacement
Address: I Street/Jibboom Street
City, ST, ZIP: Sacramento CA 95814
Client: Blackburn Consulting
EDR Inquiry: 3893331.3
Order Date: 4/1/2014 2:14:04 PM
Certification #: 5524-423E-B51B
Copyright: 1970

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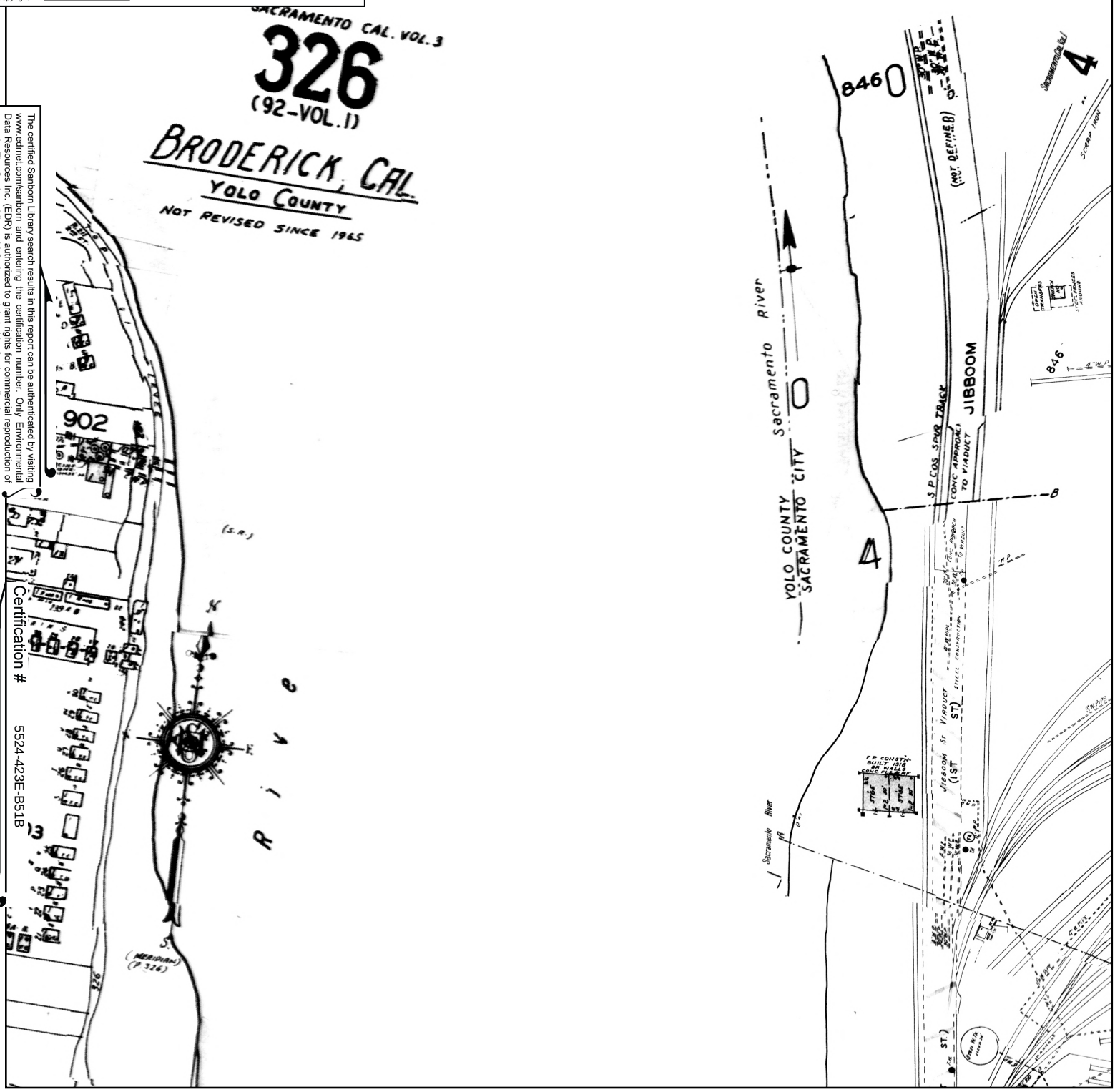
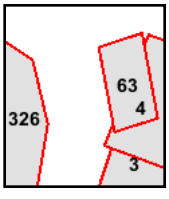
Certification # 5524-423E-B51B



This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.



Volume 3, Sheet 326
Volume 1, Sheet 63
Volume 1, Sheet 4
Volume 1, Sheet 3

0 Feet 165 330 660

N

INITIAL SITE ASSESSMENT
I STREET BRIDGE REPLACEMENT PROJECT
Sacramento, California and
West Sacramento, California

APPENDIX D

City Directory

I Street Bridge Replacement
325 3rd Street
West Sacramento, CA 95814

Inquiry Number: 3893331.5
April 03, 2014

The EDR-City Directory Abstract

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION

Executive Summary

Findings

City Directory Images

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Abstract is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Abstract includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at five year intervals.

Business directories including city, cross reference and telephone directories were reviewed, if available, at approximately five year intervals for the years spanning 1920 through 2013. This report compiles information gathered in this review by geocoding the latitude and longitude of properties identified and gathering information about properties within 660 feet of the target property.

A summary of the information obtained is provided in the text of this report.

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. An "X" indicates where information was identified in the source and provided in this report.

Year	Source	TP	Adjoining	Text Abstract	Source Image
2013	Cole Information Services	-	X	X	-
2008	Cole Information Services	-	X	X	-
2005	Haines Company, Inc.	-	X	X	-
1999	Haines & Company	-	X	X	-
1995	Pacific Bell	-	X	X	-
1991	Pacific Bell	-	X	X	-
1982	R. L. Polk & Co.	-	-	-	-
1980	R. L. Polk & Co.	-	X	X	-
1975	R. L. Polk & Co.	-	X	X	-
1970	Sacramento Directory Co.	-	X	X	-
1966	Sacramento Directory Co.	-	X	X	-
1965	Sacramento Directory Co. Publishers	-	-	-	-
1961	Sacramento Directory Co.	-	-	-	-
1957	Sacramento Directory Co.	-	-	-	-
1956	Sacramento Directory Co.	-	-	-	-
1952	Sacramento Directory Co.	-	X	X	-
1947	Sacramento Directory Co.	-	X	X	-
1942	Sacramento Directory Co.	-	X	X	-
1937	Sacramento Directory Co.	-	X	X	-
1933	Sacramento Directory Co.	-	X	X	-
1928	Sacramento Directory Co.	-	X	X	-
1923	Sacramento Directory Co.	-	X	X	-
1920	Sacramento Directory Co.	-	X	X	-

EXECUTIVE SUMMARY

SELECTED ADDRESSES

The following addresses were selected by the client, for EDR to research. An "X" indicates where information was identified.

Address	*Type*	*Findings*
325 3rd Street	Client Entered	

FINDINGS

TARGET PROPERTY INFORMATION

ADDRESS

325 3rd Street
West Sacramento, CA 95814

FINDINGS DETAIL

Target Property research detail.

FINDINGS

ADJOINING PROPERTY DETAIL

The following Adjoining Property addresses were researched for this report. Detailed findings are provided for each address.

2 F

835 2 F

Year	Uses	Source
1999	BLOCKDavid S	Haines & Company
	BLANCOSamue 13D	Haines & Company
	BLANCO Samue 13D	Haines & Company
	KINGSTONAPTS ABELK	Haines & Company
	BRUCE Richard	Haines & Company
	TYLERTimothy	Haines & Company
	SCRUGGSGeorge P	Haines & Company
	PEREZCarro Ic	Haines & Company
	K 0 NGSTON	Haines & Company

900 2 F

Year	Uses	Source
1999	BERRYJames 530D	Haines & Company

902 2 F

Year	Uses	Source
1999	XXXX	Haines & Company

2ND

807 2ND

Year	Uses	Source
1999	FEy ROJanuary	Haines & Company

813 2ND

Year	Uses	Source
1999	XXXX	Haines & Company

815 2ND

Year	Uses	Source
1999	XXXX	Haines & Company

FINDINGS

817 2ND

Year	Uses	Source
1937	Vacant	Sacramento Directory Co.
1923	Federici Rosildo	Sacramento Directory Co.
1920	Kilgore Mrs Lena	Sacramento Directory Co.

821 2ND

Year	Uses	Source
1937	Vacant	Sacramento Directory Co.

823 2ND

Year	Uses	Source
1937	Vacant	Sacramento Directory Co.
1923	Kapandrites Geo	Sacramento Directory Co.

825 2ND

Year	Uses	Source
1937	Vacant	Sacramento Directory Co.

827 2ND

Year	Uses	Source
1937	Vacant	Sacramento Directory Co.
	Vacant	Sacramento Directory Co.
1923	Giusti Frank	Sacramento Directory Co.

829 2ND

Year	Uses	Source
1937	Vacant	Sacramento Directory Co.
1923	Holmes G	Sacramento Directory Co.

831 2ND

Year	Uses	Source
1928	Baker Richd	Sacramento Directory Co.

900 2ND

Year	Uses	Source
1999	KKEEPING&TAX	Haines & Company
	SERVICE POREMBSKIJANUSZ	Haines & Company
	FULTONS PRIME RIB	Haines & Company
	VERGILIODon	Haines & Company
	ATTORNEY LAW THACKERANN	Haines & Company
	EASTON on	Haines & Company

FINDINGS

Year	Uses	Source
1999	EASTON PAINTING INC	Haines & Company
	OEASTONWendy	Haines & Company
1928	Vacant	Sacramento Directory Co.

902 2ND

Year	Uses	Source
1999	XXXX	Haines & Company
1928	Vacant	Sacramento Directory Co.

2ND AVE

817 2ND AVE

Year	Uses	Source
1966	MORAIS JOHN A	Sacramento Directory Co.

833 2ND AVE

Year	Uses	Source
1966	MOON ROBT E a	Sacramento Directory Co.

849 2ND AVE

Year	Uses	Source
1966	RICHMOND DUANE 0 G	Sacramento Directory Co.

857 2ND AVE

Year	Uses	Source
1966	EDMUNDS HORTENSE E MRS a	Sacramento Directory Co.

871 2ND AVE

Year	Uses	Source
1966	GREEN JOHN S	Sacramento Directory Co.

900 2ND AVE

Year	Uses	Source
1966	KASTRUP WILLARD W S G	Sacramento Directory Co.

2ND ST

801 2ND ST

Year	Uses	Source
2005	SHUZOFDAVIS	Haines Company, Inc.
1966	WERNER HERBERT REV MARRIAGE	Sacramento Directory Co.

FINDINGS

Year	Uses	Source
1966	COUNSELOR	Sacramento Directory Co.

803 2ND ST

Year	Uses	Source
2005	BENCHMARK	Haines Company, Inc.
	CONSULTING SERV	Haines Company, Inc.
	LTD CHADWICKNANCY	Haines Company, Inc.
	LCSW DAVIS LASER CENTER	Haines Company, Inc.
	FIVE FIGOSCOUTURE	Haines Company, Inc.
	HAIR CHALET GRACE	Haines Company, Inc.
	CHEN ROTHHARRYD	Haines Company, Inc.
	ATTORNEY AT LAW STYLE LOUNGE	Haines Company, Inc.
	TERRA & HENDRICKX	Haines Company, Inc.
	TRAVEL THEPILATES STUDIOS	Haines Company, Inc.
	DAVIS	Haines Company, Inc.
	BAYTEL	Haines Company, Inc.
	COMMUNICATIONS BAY AREA ECONOMICS	Haines Company, Inc.
	BUILDING AGGIE GARDEN	Haines Company, Inc.
	APARTMENT ARIA	Haines Company, Inc.

805 2ND ST

Year	Uses	Source
2005	PASTA 0 DAVIS	Haines Company, Inc.

807 2ND ST

Year	Uses	Source
2005	CONSTRUCTION	Haines Company, Inc.
	FERRO Rich	Haines Company, Inc.
	OFERROJanuary	Haines Company, Inc.
	FERRO RICHARD 30 M 6614722 I	Haines Company, Inc.

809 2ND ST

Year	Uses	Source
2005	JOHNSON Heldl	Haines Company, Inc.
	JOHNSON Wh Hney	Haines Company, Inc.
1966	LA BARR ANNA B MRS	Sacramento Directory Co.

FINDINGS

811 2ND ST

Year	Uses	Source
2005	CRONIN Karen	Haines Company, Inc.
	CRON 114 Richanrd	Haines Company, Inc.
1966	VACANT	Sacramento Directory Co.

813 2ND ST

Year	Uses	Source
2005	SUTTONNicole	Haines Company, Inc.
	WAIS Eugene	Haines Company, Inc.
1999	BOUCKS	Haines & Company

815 2ND ST

Year	Uses	Source
1966	HENDERSON WM H	Sacramento Directory Co.
	a 151& VACANT	Sacramento Directory Co.

817 2ND ST

Year	Uses	Source
1966	MILLER HELEN I	Sacramento Directory Co.
1928	Maushardt Candy Co	Sacramento Directory Co.

819 2ND ST

Year	Uses	Source
2005	WAIS Eugene 00 I	Haines Company, Inc.
	LOCK Steven 530 406 B	Haines Company, Inc.

821 2ND ST

Year	Uses	Source
1928	Bishup John	Sacramento Directory Co.

823 2ND ST

Year	Uses	Source
1928	Vacant	Sacramento Directory Co.

827 2ND ST

Year	Uses	Source
1928	Walzer David 2d hd	Sacramento Directory Co.
	2 Federici Sami furn	Sacramento Directory Co.

FINDINGS

829 2ND ST

Year	Uses	Source
1928	Vacant	Sacramento Directory Co.

831 2ND ST

Year	Uses	Source
2005	X 1ST	Haines Company, Inc.
	OJEDAEdw	Haines Company, Inc.
	MARTIN Michelle	Haines Company, Inc.

851 2ND ST

Year	Uses	Source
2005	XXXX	Haines Company, Inc.

900 2ND ST

Year	Uses	Source
2013	UNDERGROUND TASTING ROOM THE	Cole Information Services
	DANNYS MINI DONUTS	Cole Information Services
	HER CLOSET	Cole Information Services
	HARVEY HOUSE OLD SACRAMENTO	Cole Information Services
2008	WEST END BAR & GRILL	Cole Information Services
	SEVENTEEN	Cole Information Services
	CHEZPOOCHE OF OLD SACRAMENTO	Cole Information Services
	FULTONS	Cole Information Services
2005	SOUZA Thomas	Haines Company, Inc.
1995	Fultons Prime Rib	Pacific Bell
1991	Fultons Prime Rib	Pacific Bell
1966	WELLS TOM AGENCY REAL EST	Sacramento Directory Co.

902 2ND ST

Year	Uses	Source
2005	BEWSTracey	Haines Company, Inc.
	X JST	Haines Company, Inc.
1980	Vacant	R. L. Polk & Co.
1966	FABOZZI RALPH N GENERAL	Sacramento Directory Co.
	INSURANCE	Sacramento Directory Co.
	RALPH REALTY	Sacramento Directory Co.

904 2ND ST

Year	Uses	Source
2013	HUGGIEBEARS	Cole Information Services

Year	Uses	Source
2008	THE OLD TRAIN ESPRESSO & SMOOTHIE	Cole Information Services

FIREHOUSE ALY

1107 FIREHOUSE ALY

Year	Uses	Source
2013	BROOKS NOVELTY ANTIQUES	Cole Information Services
1991	Abbey Graphics & Galleries	Pacific Bell

FRONT ST

855 FRONT ST

Year	Uses	Source
1991	EKONA Ehrenkrantz Kamages	Pacific Bell

I

10 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

101 I

Year	Uses	Source
1952	Guill L M	Sacramento Directory Co.
	Alcoholics Anonymous	Sacramento Directory Co.
1942	Municipal Recreation	Sacramento Directory Co.
	Center for Men	Sacramento Directory Co.

11 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.
1920	Contiued	Sacramento Directory Co.

110 I

Year	Uses	Source
1952	Carpenter M R whse	Sacramento Directory Co.
1942	Vacant	Sacramento Directory Co.
1923	Gonzalez John	Sacramento Directory Co.
1920	Gonzales Bernabe	Sacramento Directory Co.

FINDINGS

111 I

Year	Uses	Source
1952	Johnson Distributing Co jan sups	Sacramento Directory Co.
1942	Vacant	Sacramento Directory Co.

113 I

Year	Uses	Source
1920	Traversi Giacomo	Sacramento Directory Co.

115 I

Year	Uses	Source
1952	Errington C E	Sacramento Directory Co.
	I Street Hotel	Sacramento Directory Co.
1942	Mizutani M furn rms	Sacramento Directory Co.
1923	Traversi Giacomo	Sacramento Directory Co.
	Italia Hotel	Sacramento Directory Co.
1920	Frederici Rosildo	Sacramento Directory Co.
	Italia Hotel	Sacramento Directory Co.

116 I

Year	Uses	Source
1942	Lacy Thos cigars	Sacramento Directory Co.

118 I

Year	Uses	Source
1952	Del Monte Hotel	Sacramento Directory Co.
1942	Kawaguchi Tama Mrs	Sacramento Directory Co.
	Del Monte Hotel	Sacramento Directory Co.

120 I

Year	Uses	Source
1942	U S Civil Service Comm	Sacramento Directory Co.
	Mission	Sacramento Directory Co.
	Sacramento Rescue	Sacramento Directory Co.
1923	Varanini Emilio	Sacramento Directory Co.
	Santini Giovanni	Sacramento Directory Co.
	Del Monte Hotel	Sacramento Directory Co.
1920	Varanini Emilip	Sacramento Directory Co.
	Santini Giovanni	Sacramento Directory Co.
	Del Monte Hotel	Sacramento Directory Co.

FINDINGS

122 I

Year	Uses	Source
1942	Vacant	Sacramento Directory Co.

129 I

Year	Uses	Source
1942	Sum Louie	Sacramento Directory Co.

13 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.
1920	!07b Schwartz Mrs Mary	Sacramento Directory Co.

130 I

Year	Uses	Source
1923	Oriental	Sacramento Directory Co.
1920	Oriental	Sacramento Directory Co.

14 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

15 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

16 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

17 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

18 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

19 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

FINDINGS

2 I

Year	Uses	Source
2013	OLD SACRAMENTO MERCHANTS	Cole Information Services
1942	th intersects	Sacramento Directory Co.
	d intersects	Sacramento Directory Co.

20 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

22 I

Year	Uses	Source
1942	d intersects	Sacramento Directory Co.

23 I

Year	Uses	Source
1942	d intersects	Sacramento Directory Co.

24 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

25 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

26 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

27 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

28 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

29 I

Year	Uses	Source
1942	th inter	Sacramento Directory Co.

FINDINGS

3 I

Year	Uses	Source
1942	d intersects	Sacramento Directory Co.

30 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

33 I

Year	Uses	Source
1942	d intersects	Sacramento Directory Co.

35 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

39 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

4 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

41 I

Year	Uses	Source
1942	st intersects	Sacramento Directory Co.

42 I

Year	Uses	Source
1942	d intersects	Sacramento Directory Co.

44 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

5 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

6 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

FINDINGS

7 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.
1920	3304 Leamon J H	Sacramento Directory Co.

8 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

9 I

Year	Uses	Source
1942	th intersects	Sacramento Directory Co.

I PKY

5 I PKY

Year	Uses	Source
1999	E 16 JACK Michael	Haines & Company

I ST

081 I ST

Year	Uses	Source
1937	s ait Z lx Sra Ua	Sacramento Directory Co.
	ftntt TMmw ll S W fi rc il ftt	Sacramento Directory Co.
	B G itrurtxde L P	Sacramento Directory Co.
	rekar Arnold By Ci ante rae	Sacramento Directory Co.
	li UO at Hi i li H k S fticw Ki	Sacramento Directory Co.

1 I ST

Year	Uses	Source
1975	Vacant	R. L. Polk & Co.
1970	Vacant	Sacramento Directory Co.
	B Ah As soc iates reserch	Sacramento Directory Co.
	9 1 W Lr a i lin R P	Sacramento Directory Co.
	Byron Eliz Mrs	Sacramento Directory Co.
1966	431 BROWNIE MUFFLER SLS & REPR	Sacramento Directory Co.
	HINTZ EVe LYN M	Sacramento Directory Co.
	COURTER CLIFF L G	Sacramento Directory Co.
	C GUNNETTE KATHLEEN	Sacramento Directory Co.
1937	st fl County Treasurer	Sacramento Directory Co.

FINDINGS

Year	Uses	Source
1937	County Dept of Pub	Sacramento Directory Co.
	lic Welfare	Sacramento Directory Co.
	County Free Optical	Sacramento Directory Co.
	Clinic	Sacramento Directory Co.
	County Agricultural	Sacramento Directory Co.
	Agent	Sacramento Directory Co.
	County Farm Bureau	Sacramento Directory Co.
	County Home Demon	Sacramento Directory Co.
	stration Agent	Sacramento Directory Co.
	County Agricultural	Sacramento Directory Co.
	County Sealer of	Sacramento Directory Co.
	Weights and Meas	Sacramento Directory Co.
	County Commissary	Sacramento Directory Co.
	County Constables	Sacramento Directory Co.
	th Lb Intericts	Sacramento Directory Co.
	U lcpani Auzt C	Sacramento Directory Co.
	3 Calvary B pt	Sacramento Directory Co.
	041 T rd J W r	Sacramento Directory Co.
	lit l la K M	Sacramento Directory Co.
	irn lyf JK r s	Sacramento Directory Co.
	a 71 At A B Qi	Sacramento Directory Co.
	IT 03 4 Chto B Anthonj	Sacramento Directory Co.
	10 Hi Ul John	Sacramento Directory Co.
	f 81 li Pnw wth Hi:	Sacramento Directory Co.
	818 Ald 4lermn Oawte Xig	Sacramento Directory Co.

10 I ST

Year	Uses	Source
1975	c N Brederman B	R. L. Polk & Co.
	b N Betschart W	R. L. Polk & Co.
	a N Gonzales J	R. L. Polk & Co.
	hla Herchsolz Pat	R. L. Polk & Co.
	llb N Brosi Judy	R. L. Polk & Co.
	lic Vacant	R. L. Polk & Co.
1966	VACANT	Sacramento Directory Co.
	A MORGAN LILLIAN MRS	Sacramento Directory Co.
	B SHERMAN CLARA	Sacramento Directory Co.
	C CANDRICK CECLIA H	Sacramento Directory Co.
	h XA UHL HELEN G	Sacramento Directory Co.

FINDINGS

Year	Uses	Source
1966	KANE GORDON T	Sacramento Directory Co.
	SMITH NELLIS	Sacramento Directory Co.
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
	r n Mr o	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

100 I ST

Year	Uses	Source
1975	City Auditor	R. L. Polk & Co.

101 I ST

Year	Uses	Source
2013	CITY OF SACRAMENTO	Cole Information Services
	OLD SACRAMENTO MERCHANTS	Cole Information Services
2008	DISCOVERY MUSEUM VINTAGE TOY	Cole Information Services
	SACRAMENTO MUSEUMHISTORY	Cole Information Services
2005	HSTRYCNTR SAC HISTORY MUSEUM	Haines Company, Inc.
	SACCTYCNVNTNMSM	Haines Company, Inc.
	LRNNGC HISTORYCENTER	Haines Company, Inc.
	MSMS&CHLLNGR	Haines Company, Inc.
	DISCOVERY	Haines Company, Inc.
1995	Sacramento History Museum	Pacific Bell
	History Center	Pacific Bell
1991	Sacramento History Center	Pacific Bell
	History Center	Pacific Bell
1975	Prudential Insurance Co	R. L. Polk & Co.
1970	Prudential Insurance Co	Sacramento Directory Co.
1947	Vacant	Sacramento Directory Co.
1937	Center for Men	Sacramento Directory Co.
	Municipal Recreation	Sacramento Directory Co.
1933	Center for Men	Sacramento Directory Co.
	Municipal Recreation	Sacramento Directory Co.

103 I ST

Year	Uses	Source
1937	County Recorder	Sacramento Directory Co.

FINDINGS

104 I ST

Year	Uses	Source
1975	City Collr	R. L. Polk & Co.
1970	City Collr	Sacramento Directory Co.

106 I ST

Year	Uses	Source
1937	County Assessor	Sacramento Directory Co.

107 I ST

Year	Uses	Source
2005	BURNSDoyle	Haines Company, Inc.
1970	City Controller	Sacramento Directory Co.

109 I ST

Year	Uses	Source
1975	City Mgr	R. L. Polk & Co.
1970	City Mgr	Sacramento Directory Co.
1937	County Clerk	Sacramento Directory Co.

11 I ST

Year	Uses	Source
1966	SCHWINGE WM	Sacramento Directory Co.
	NORDSETH AMY R	Sacramento Directory Co.
	VAN DOREN LANE	Sacramento Directory Co.
1947	th Intersects	Sacramento Directory Co.
1937	n 1 Mihild Mrs	Sacramento Directory Co.
	818 Ahw h Mrs	Sacramento Directory Co.
	It I raVifi lini vflt L f re	Sacramento Directory Co.
	xa 17 7t tnti S	Sacramento Directory Co.
	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.
	I Contd	Sacramento Directory Co.

110 I ST

Year	Uses	Source
1966	LUCAS MFG CO UPHOL	Sacramento Directory Co.
	CARPENTER M R INC SHOP	Sacramento Directory Co.
	Ill A 1 UPHOLSTERY G	Sacramento Directory Co.
1947	Vacant	Sacramento Directory Co.
1937	Vacant	Sacramento Directory Co.

FINDINGS

Year	Uses	Source
1933	Vacant	Sacramento Directory Co.
1928	Oriental	Sacramento Directory Co.

111 I ST

Year	Uses	Source
2013	STATE OF CALIFORNIA	Cole Information Services
	CALIFORNIA STATE RAILROAD MUSEUM	Cole Information Services
	EAGLE THEATER	Cole Information Services
	SACRAMENTO SOUTHERN RAILROAD	Cole Information Services
2008	CA DEPT PARKS & RECREATION	Cole Information Services
	CA STATE OF PARKS & RECREATION DEPT	Cole Information Services
	CALIFORNIA STATE	Cole Information Services
2005	CA ST RAILROAD	Haines Company, Inc.
	MUSEUM BUS OFC EAGLETHEATER	Haines Company, Inc.
	SACSOUTHERN	Haines Company, Inc.
	RAILROAD	Haines Company, Inc.
1995	Calif State Railroad Museum	Pacific Bell
	Railroad Museum See Calif State Railroad Museum	Pacific Bell
1975	Vacant	R. L. Polk & Co.
1947	Koelring Co constr	Sacramento Directory Co.
	equip	Sacramento Directory Co.
1937	Walworth Califor	Sacramento Directory Co.
	nia Co plmbg supp	Sacramento Directory Co.
	tma M Sm	Sacramento Directory Co.
	llt e H At k	Sacramento Directory Co.
1933	Vacant	Sacramento Directory Co.
1928	Stulsaft M & Co	Sacramento Directory Co.
	plmbrs supp	Sacramento Directory Co.

112 I ST

Year	Uses	Source
2005	ANITAS GIFT SHOP	Haines Company, Inc.
1975	City Water & Sewer Dept	R. L. Polk & Co.
1970	City Water & Sewer Dept	Sacramento Directory Co.

113 I ST

Year	Uses	Source
1937	Vacant	Sacramento Directory Co.

FINDINGS

Year	Uses	Source
1933	Ruiz Juan	Sacramento Directory Co.
	Vacant	Sacramento Directory Co.
	Italia Hotel	Sacramento Directory Co.
1928	Romiti Frank turn	Sacramento Directory Co.

114 I ST

Year	Uses	Source
1937	Vacant	Sacramento Directory Co.
1933	Vacant	Sacramento Directory Co.
1928	Bock F E auto repr	Sacramento Directory Co.

115 I ST

Year	Uses	Source
1975	City Treas	R. L. Polk & Co.
1970	City Treas	Sacramento Directory Co.
1966	I STREET HOTEL LODGINGS	Sacramento Directory Co.
	CITY TREAS	Sacramento Directory Co.
1947	Thompson John	Sacramento Directory Co.
	I Street Hotel	Sacramento Directory Co.
1933	Vacant	Sacramento Directory Co.
1928	Italia Hotel	Sacramento Directory Co.
	Luigi Evaristo	Sacramento Directory Co.

116 I ST

Year	Uses	Source
2013	VEGAS COUNTRY MARKET	Cole Information Services
	TRAILMIX NET INC	Cole Information Services
2008	JETT MODERN AS ARBOGAST DESIGN	Cole Information Services
2005	REALTYWORLDHOME	Haines Company, Inc.
1991	Heidis Music Boxes Etc	Pacific Bell
	Heidis Music Boxes & Etc	Pacific Bell
1937	Meredith Fish Co	Sacramento Directory Co.
	w Vacant	Sacramento Directory Co.
	County Auditor	Sacramento Directory Co.
1933	Meredith Fish Co	Sacramento Directory Co.
	Vacant	Sacramento Directory Co.
1928	Meredith Fish Co	Sacramento Directory Co.
	Varanini Emilio	Sacramento Directory Co.
	mens furngs	Sacramento Directory Co.

FINDINGS

117 I ST

Year	Uses	Source
1933	Vacant	Sacramento Directory Co.
1928	Vacant	Sacramento Directory Co.

118 I ST

Year	Uses	Source
2008	WPM PLANNING TEAM INC	Cole Information Services
2005	WPM INC	Haines Company, Inc.
	KDS OF ALL	Haines Company, Inc.
	REPORTERS TOY KNGHTS TYSFOR	Haines Company, Inc.
	DIAMOND COURT	Haines Company, Inc.
	OLDSAC MERCHANTS	Haines Company, Inc.
	ILEPOST	Haines Company, Inc.
	DAHLINDJ	Haines Company, Inc.
	DAHLIN DENNIS J ASLA	Haines Company, Inc.
1995	G B Properties Inc	Pacific Bell
	Julias Clown World	Pacific Bell
	Solomon Frank Jr atty	Pacific Bell
	Vernon Brannan Building Management	Pacific Bell
1991	Hawaiian Cotton Co	Pacific Bell
1975	U S Army Recruiting Ofc	R. L. Polk & Co.
1966	A TTOMAS BESS K G	Sacramento Directory Co.
	C NORMAN ALYCE MRS	Sacramento Directory Co.
	PERKINS LUTHER	Sacramento Directory Co.
	DEL MONTE HOTEL G	Sacramento Directory Co.
1947	Del Monte Hotel	Sacramento Directory Co.
	Haddix Orville	Sacramento Directory Co.
1937	Del Monte Hotel	Sacramento Directory Co.
1933	Del Monte Hotel	Sacramento Directory Co.
	Kobata Jutaro	Sacramento Directory Co.
1928	Del Monte Hotel	Sacramento Directory Co.
	Kobota J	Sacramento Directory Co.

119 I ST

Year	Uses	Source
1937	County Tax and	Sacramento Directory Co.
	License Collector	Sacramento Directory Co.
1933	Vacant	Sacramento Directory Co.

FINDINGS

12 I ST

Year	*Uses*	*Source*
1975	a N Howard Ann	R. L. Polk & Co.
	b N Yarbrough G	R. L. Polk & Co.
	c N Brusco C	R. L. Polk & Co.
1970	Vetr Of Foreign Wars Building	Sacramento Directory Co.
	Treo n atr Mi & J ft	Sacramento Directory Co.
1966	MOORE M	Sacramento Directory Co.
	WEINER ALEX	Sacramento Directory Co.
	REAR PIERCEY JOHN D	Sacramento Directory Co.
	BUCKBESH BARBARA	Sacramento Directory Co.
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

120 I ST

Year	*Uses*	*Source*
2008	COCHLAN ASSOCIATES MANAGEMENT INC	Cole Information Services
2005	MAX IMAGES	Haines Company, Inc.
	BLONDIES	Haines Company, Inc.
1995	Scratch Billiards & Deli	Pacific Bell
	Cochlan Iris M CPM	Pacific Bell
	COCHLAN ASSOCIATES MANAGEMENT CO	Pacific Bell
	Association For Retarded Citizens	Pacific Bell
1991	Cochlan Iris M CPM	Pacific Bell
	COCHLAN ASSOCIATES MANAGEMENT CO	Pacific Bell
1975	U S Air Force Recruiting Ofc	R. L. Polk & Co.
1966	WALL IS M G	Sacramento Directory Co.
1937	Vananini Eminlio restr	Sacramento Directory Co.
1933	Economy Restaurant	Sacramento Directory Co.
1928	Vacant	Sacramento Directory Co.

122 I ST

Year	*Uses*	*Source*
2013	CANDYLAND	Cole Information Services
2008	ISIS BAZAAR	Cole Information Services
	HUMAN CAPITAL MANAGEMENT INC	Cole Information Services
	THE HAIR PALACE	Cole Information Services

FINDINGS

Year	Uses	Source
2008	CANDYLAND	Cole Information Services
2005	THE ROYAL HAIR	Haines Company, Inc.
	CANDYLAND	Haines Company, Inc.
	X 2ND ST	Haines Company, Inc.
	PALACE	Haines Company, Inc.
1933	Vacant	Sacramento Directory Co.
1928	drinks	Sacramento Directory Co.
	Giacoboni Thos soft	Sacramento Directory Co.
	:6 Harmer R J	Sacramento Directory Co.

125 I ST

Year	Uses	Source
2005	LA Bar Michael	Haines Company, Inc.
	1ST ST	Haines Company, Inc.

128 I ST

Year	Uses	Source
1966	CARPENTER JUNE B G	Sacramento Directory Co.
1933	Vacant	Sacramento Directory Co.
1928	Oriental	Sacramento Directory Co.

129 I ST

Year	Uses	Source
1937	V 2 Vacant	Sacramento Directory Co.
1933	Oriental	Sacramento Directory Co.
1928	Vacant	Sacramento Directory Co.

13 I ST

Year	Uses	Source
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

130 I ST

Year	Uses	Source
2005	KIMBROUGHM	Haines Company, Inc.
1937	Tb Long Jack	Sacramento Directory Co.
1933	Vacant	Sacramento Directory Co.
1928	drinks	Sacramento Directory Co.
	Walsh R A soft	Sacramento Directory Co.

FINDINGS

132 I ST

Year	Uses	Source
1975	U S Coast Guard Recruiting Ofc	R. L. Polk & Co.

14 I ST

Year	Uses	Source
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

142 I ST

Year	Uses	Source
2005	FOSTER Mark	Haines Company, Inc.

145 I ST

Year	Uses	Source
2005	HOUSTON Beverely	Haines Company, Inc.

15 I ST

Year	Uses	Source
1947	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

16 I ST

Year	Uses	Source
1970	T ST INTERSECTS	Sacramento Directory Co.
	City Waste Removal Serv Dept	Sacramento Directory Co.
1947	th intersects	Sacramento Directory Co.
1937	th L nthrsectn	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

17 I ST

Year	Uses	Source
1970	Eye Street Lader L	Sacramento Directory Co.
	Brr asa Bod Shops 448 5903ea	Sacramento Directory Co.
1947	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

18 I ST

Year	Uses	Source
1970	I ST&EET Contd	Sacramento Directory Co.
	ee Bib r epr	Sacramento Directory Co.

FINDINGS

Year	Uses	Source
1970	E 1 8 I Dah I te	Sacramento Directory Co.
	I i S lo We Hung Am	Sacramento Directory Co.
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
	a Mevine L B	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.
1928	08 Bernhard N A Mrs	Sacramento Directory Co.

19 I ST

Year	Uses	Source
1970	USM 11t 4z J M 443g 1 7550j	Sacramento Directory Co.
1947	th intersects	Sacramento Directory Co.
1933	Z 7 b Pegler R H	Sacramento Directory Co.
	th intersects	Sacramento Directory Co.

2 I ST

Year	Uses	Source
1975	Chadwick Chad	R. L. Polk & Co.
	Garlick Emily B	R. L. Polk & Co.
	dfl Sac Housing & Redevelopment	R. L. Polk & Co.
	Agcy Acctg	R. L. Polk & Co.
	Sac Housing & Redevelopment Agcy	R. L. Polk & Co.
	Tenant Servia	R. L. Polk & Co.
	d Fl Friesen John restr	R. L. Polk & Co.
	a Federated Firefighters Of Calif A F	R. L. Polk & Co.
	L C I lab org	R. L. Polk & Co.
	c Century Development Corp real	R. L. Polk & Co.
	estate	R. L. Polk & Co.
	d Landmark Structures Inc	R. L. Polk & Co.
	N Phillips M	R. L. Polk & Co.
1970	Van Wye Ollie Mrs	Sacramento Directory Co.
	d Fl Hanna & Brophy lwyrs	Sacramento Directory Co.
1966	MANLEY CARL	Sacramento Directory Co.
	BERTALON SUSAN	Sacramento Directory Co.
	A MILLER BERTHA MRS GIB	Sacramento Directory Co.
	C HUNT ALVIN L G	Sacramento Directory Co.
	SMITH ADELINE MRS	Sacramento Directory Co.
1947	d intersects	Sacramento Directory Co.
1937	d hd gds	Sacramento Directory Co.

FINDINGS

Year	Uses	Source
1937	d hd gds	Sacramento Directory Co.
	&20c Milnes Frances A	Sacramento Directory Co.
	e 2 CG Hyams L G	Sacramento Directory Co.
	County Superior	Sacramento Directory Co.
	County Superior	Sacramento Directory Co.
	County Superior	Sacramento Directory Co.
	pervisors	Sacramento Directory Co.
	d fl County Board of Su	Sacramento Directory Co.
	ciety	Sacramento Directory Co.
	nd fl Travelers Aid So	Sacramento Directory Co.
	d intersects	Sacramento Directory Co.
1933	2111/2 Vacant	Sacramento Directory Co.
	d intersects	Sacramento Directory Co.
1928	:508 Norman T K	Sacramento Directory Co.
	&20b Carter Carol Mrs	Sacramento Directory Co.

20 I ST

Year	Uses	Source
1966	ST INTERSECTS	Sacramento Directory Co.
1947	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

21 I ST

Year	Uses	Source
1937	a Gr B L	Sacramento Directory Co.

22 I ST

Year	Uses	Source
1947	d intersects	Sacramento Directory Co.
1937	d intersects	Sacramento Directory Co.
1933	d intersects	Sacramento Directory Co.

23 I ST

Year	Uses	Source
1947	d intersects	Sacramento Directory Co.
1937	d intersects	Sacramento Directory Co.
1933	d intersects	Sacramento Directory Co.

FINDINGS

24 I ST

Year	Uses	Source
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

25 I ST

Year	Uses	Source
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

26 I ST

Year	Uses	Source
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

27 I ST

Year	Uses	Source
1947	th intersects	Sacramento Directory Co.
1937	lla Williams J R	Sacramento Directory Co.
	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

28 I ST

Year	Uses	Source
1966	SEGER JULIA D MRS CX	Sacramento Directory Co.
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.
	! 2801 Holmes W E o	Sacramento Directory Co.

29 I ST

Year	Uses	Source
1947	th interfsects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

3 I ST

Year	Uses	Source
1975	N r Van Tassel Steven J	R. L. Polk & Co.

FINDINGS

Year	Uses	Source
1975	Thompson Olga A Mrs	R. L. Polk & Co.
	Zaleaki Jim C	R. L. Polk & Co.
	d Fl Procter & Gamble Distributing	R. L. Polk & Co.
	Agcy ADMN	R. L. Polk & Co.
	Co soap mfr	R. L. Polk & Co.
	dfl Sac Housing & Redevelopment	R. L. Polk & Co.
	Redevelopment Agcy Legal Div	R. L. Polk & Co.
	dfl Sacramento Housing	R. L. Polk & Co.
1970	d Fl ONeill Frank A restr	Sacramento Directory Co.
	City Fire Dept	Sacramento Directory Co.
	rans Of Foreign Wars	Sacramento Directory Co.
	Aasletten Ellan A	Sacramento Directory Co.
	d Fl Procter & Gamble Distributing	Sacramento Directory Co.
	Co soap mfr	Sacramento Directory Co.
1966	SANFORD C R	Sacramento Directory Co.
	A HAMMAN NINA M MRS	Sacramento Directory Co.
	C MOIR PEGGY J	Sacramento Directory Co.
	VACANT	Sacramento Directory Co.
	ZENTNER ANNE G	Sacramento Directory Co.
	SANDERS A	Sacramento Directory Co.
	GRIGSBY HOWARD B	Sacramento Directory Co.
	MULHERN M RUTH	Sacramento Directory Co.
1947	d intersects	Sacramento Directory Co.
1937	d intersects	Sacramento Directory Co.
	Webb SB Br	Sacramento Directory Co.
	lieffenbacltoe JS B	Sacramento Directory Co.
	County Superior	Sacramento Directory Co.
	d fl County Law Library	Sacramento Directory Co.
	d intersects	Sacramento Directory Co.
1933	d intersects	Sacramento Directory Co.

30 I ST

Year	Uses	Source
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

FINDINGS

33 I ST

Year	Uses	Source
1947	d intersects	Sacramento Directory Co.
1937	d intersects	Sacramento Directory Co.
1933	d intersects	Sacramento Directory Co.

35 I ST

Year	Uses	Source
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

36 I ST

Year	Uses	Source
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

38 I ST

Year	Uses	Source
1966	GARVERICK ETHEL MRS	Sacramento Directory Co.

39 I ST

Year	Uses	Source
1947	th intersects	Sacramento Directory Co.

4 I ST

Year	Uses	Source
1975	N Medearis James K	R. L. Polk & Co.
	Vacant	R. L. Polk & Co.
	Hatch Brian A	R. L. Polk & Co.
	N Wood Craig	R. L. Polk & Co.
1970	ea Wiere Jackrfi	Sacramento Directory Co.
	44744	Sacramento Directory Co.
	n er isato Phr iwyr	Sacramento Directory Co.
	Pop Ro Jr aiwyr	Sacramento Directory Co.
	Snyder L Miles wyrs	Sacramento Directory Co.
	Vlirga John E Iw 7yr	Sacramento Directory Co.
	Tobias Anna Mrs	Sacramento Directory Co.
1966	RANSON CHET	Sacramento Directory Co.
	A POWERS ELIZ T MRS H	Sacramento Directory Co.
	C AVERY BLANCHE	Sacramento Directory Co.
	WELSH KENNETH C	Sacramento Directory Co.

FINDINGS

Year	Uses	Source
1966	HAMMERSLEY PARKER G	Sacramento Directory Co.
	SANFTOS THOS J	Sacramento Directory Co.
	DUDMAN DOROTHY	Sacramento Directory Co.
	KENEALY WM H H	Sacramento Directory Co.
	LATHAM RAYMOND A	Sacramento Directory Co.
	CAMPBELL ELIZ MRS	Sacramento Directory Co.
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
	bet 4th & 5th Terminal	Sacramento Directory Co.
	Post Office Bidg	Sacramento Directory Co.
	th intersects	Sacramento Directory Co.

40 I ST

Year	Uses	Source
1937	th intersects	Sacramento Directory Co.

41 I ST

Year	Uses	Source
1947	st intersects	Sacramento Directory Co.

42 I ST

Year	Uses	Source
1947	d intersects	Sacramento Directory Co.
1937	3 intersects	Sacramento Directory Co.

44 I ST

Year	Uses	Source
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

45 I ST

Year	Uses	Source
1947	th intersects	Sacramento Directory Co.
1928	th Cross streets from	Sacramento Directory Co.

48 I ST

Year	Uses	Source
1966	CLARK MABEL 0 MRS G	Sacramento Directory Co.

FINDINGS

5 I ST

Year	Uses	Source
1975	Sc N Burket T J	R. L. Polk & Co.
	Vacant	R. L. Polk & Co.
	b Knisley S	R. L. Polk & Co.
1970	City Civ Defense	Sacramento Directory Co.
	Veterans Of Foreign War Ladies	Sacramento Directory Co.
	Auxiliary	Sacramento Directory Co.
1966	BASHAW CLAUDE	Sacramento Directory Co.
	A HADDOCK OPAL F	Sacramento Directory Co.
	B LOVE BERNICE	Sacramento Directory Co.
	SC HOOKER ELLFN	Sacramento Directory Co.
	VACANT	Sacramento Directory Co.
	MALEK FELICIA	Sacramento Directory Co.
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

6 I ST

Year	Uses	Source
1975	N Allen R	R. L. Polk & Co.
	N Wood John A	R. L. Polk & Co.
	a N Fenn	R. L. Polk & Co.
	b N Westfall B	R. L. Polk & Co.
	c N Huntley C	R. L. Polk & Co.
	N Huff Dennis K	R. L. Polk & Co.
	N Hulse David A	R. L. Polk & Co.
1966	ROSE ELIZ	Sacramento Directory Co.
	A MC CARTY CATH	Sacramento Directory Co.
	C CALVIFR 1 VELYN	Sacramento Directory Co.
	CROPPER JOAN	Sacramento Directory Co.
	VACANT	Sacramento Directory Co.
	BERRIAN JOHN A	Sacramento Directory Co.
	MAXWELL NORMA	Sacramento Directory Co.
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

FINDINGS

68 I ST

Year	Uses	Source
1966	LINNET DAGMAR	Sacramento Directory Co.

7 I ST

Year	Uses	Source
1975	N Frank Carlton T	R. L. Polk & Co.
	c N Harp C	R. L. Polk & Co.
	N Brown Robt W	R. L. Polk & Co.
	a N Duncan M	R. L. Polk & Co.
	b Vacant	R. L. Polk & Co.
	N Mc Entee Dan	R. L. Polk & Co.
1970	Tomic Nicholas A archt	Sacramento Directory Co.
1966	VACANT	Sacramento Directory Co.
	BAKER CLARA J	Sacramento Directory Co.
	A LONG LAURA M MRS	Sacramento Directory Co.
	C PFEIER JANE B	Sacramento Directory Co.
	BA LAMBERT MARGT	Sacramento Directory Co.
	MIDDLETON STEVEN	Sacramento Directory Co.
	SMITH J D	Sacramento Directory Co.
	SEGINA NICK	Sacramento Directory Co.
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

72 I ST

Year	Uses	Source
1966	ST INTERSECTS	Sacramento Directory Co.

78 I ST

Year	Uses	Source
1966	REGLI ALICE E G	Sacramento Directory Co.

8 I ST

Year	Uses	Source
1975	a Me Donald M	R. L. Polk & Co.
	c N ken G	R. L. Polk & Co.
	No Return	R. L. Polk & Co.
	b N Hoffman M	R. L. Polk & Co.
1970	Greens Leroy F consulting eng	Sacramento Directory Co.
	T Wii Mrs	Sacramento Directory Co.

FINDINGS

Year	Uses	Source
1966	GREENE LEROY F CONSULTING	Sacramento Directory Co.
	VACANT	Sacramento Directory Co.
	B GILBERT LILLIE S G	Sacramento Directory Co.
	C SIMON LILLIAN T MRS	Sacramento Directory Co.
	VACANT	Sacramento Directory Co.
	REED LINDA	Sacramento Directory Co.
	VACANT	Sacramento Directory Co.
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.
1928	S 1 Craveroiler Co auto	Sacramento Directory Co.
	Duane Edw	Sacramento Directory Co.
	Mc Gill R A	Sacramento Directory Co.

9 I ST

Year	Uses	Source
1975	c N Stroud D	R. L. Polk & Co.
	b N Paredes S	R. L. Polk & Co.
	a N Ryder D	R. L. Polk & Co.
	N Hinman R	R. L. Polk & Co.
1966	BILLINGLY BETTE	Sacramento Directory Co.
	C KILEY FLORENCE MRS	Sacramento Directory Co.
	A PETERSEN ALMA M	Sacramento Directory Co.
	LACKENBACH WILMA MRS	Sacramento Directory Co.
1947	th intersects	Sacramento Directory Co.
1937	th intersects	Sacramento Directory Co.
1933	th intersects	Sacramento Directory Co.

98 I ST

Year	Uses	Source
1966	PALMER ALICE E	Sacramento Directory Co.

INCA CT

1 INCA CT

Year	Uses	Source
2008	YU SUN KANG	Cole Information Services

FINDINGS

INTERSTATE 80 AT MADISON

1 INTERSTATE 80 AT MADISON

Year	*Uses*	*Source*
2013	FUTURE FORD	Cole Information Services
	FUTURE FORD ISUZU TRUCK CENTER	Cole Information Services

FINDINGS

TARGET PROPERTY: ADDRESS NOT IDENTIFIED IN RESEARCH SOURCE

The following Target Property addresses were researched for this report, and the addresses were not identified in the research source.

Address Researched	Address Not Identified in Research Source
325 3rd Street	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920

ADJOINING PROPERTY: ADDRESSES NOT IDENTIFIED IN RESEARCH SOURCE

The following Adjoining Property addresses were researched for this report, and the addresses were not identified in research source.

Address Researched	Address Not Identified in Research Source
081 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1933, 1928, 1923, 1920
1 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1933, 1928, 1923, 1920
1 INCA CT	2013, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
1 INTERSTATE 80 AT MADISON	2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
10 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
10 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1970, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
100 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
101 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1947, 1937, 1933, 1928, 1923, 1920
101 I ST	2013, 2008, 1999, 1982, 1980, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
101 I ST	2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
103 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1933, 1928, 1923, 1920
104 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
106 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1933, 1928, 1923, 1920
107 I ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
109 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1933, 1928, 1923, 1920
11 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923

FINDINGS

Address Researched	Address Not Identified in Research Source
11 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
110 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1947, 1937, 1933, 1928
110 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1942, 1923, 1920
1107 FIREHOUSE ALY	2013, 2008, 2005, 1999, 1995, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
1107 FIREHOUSE ALY	2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
111 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1947, 1937, 1933, 1928, 1923, 1920
111 I ST	2013, 2008, 1999, 1991, 1982, 1980, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1923, 1920
111 I ST	2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
112 I ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
113 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923
113 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1923, 1920
114 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1923, 1920
115 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1947, 1937, 1933, 1928
115 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1965, 1961, 1957, 1956, 1952, 1942, 1937, 1923, 1920
116 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
116 I ST	2013, 2008, 1999, 1995, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1923, 1920
116 I ST	2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
117 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1923, 1920
118 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1947, 1937, 1933, 1928, 1923, 1920
118 I ST	2013, 2008, 1999, 1982, 1980, 1970, 1965, 1961, 1957, 1956, 1952, 1942, 1923, 1920
118 I ST	2013, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
119 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1928, 1923, 1920
12 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
120 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928

FINDINGS

Address Researched	Address Not Identified in Research Source
120 I ST	2013, 2008, 1999, 1982, 1980, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1923, 1920
120 I ST	2013, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
122 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
122 I ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1923, 1920
122 I ST	2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
125 I ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
128 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1923, 1920
129 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
129 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1923, 1920
13 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923
13 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
130 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928
130 I ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1923, 1920
132 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
14 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
14 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
142 I ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
145 I ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
15 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
15 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1937, 1928, 1923, 1920
16 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
16 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
17 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
17 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1937, 1928, 1923, 1920

FINDINGS

Address Researched	Address Not Identified in Research Source
18 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
18 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1923, 1920
19 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
19 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1937, 1928, 1923, 1920
2 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
2 I	2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
2 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1965, 1961, 1957, 1956, 1952, 1942, 1923, 1920
20 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
20 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1942, 1937, 1928, 1923, 1920
21 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1933, 1928, 1923, 1920
22 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
22 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
23 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
23 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
24 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
24 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
25 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
25 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
26 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
26 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
27 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
27 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
28 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
28 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920

FINDINGS

Address Researched	Address Not Identified in Research Source
29 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
29 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1937, 1928, 1923, 1920
3 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
3 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
30 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
30 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
33 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
33 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
35 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
35 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1928, 1923, 1920
36 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1928, 1923, 1920
38 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
39 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
39 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1937, 1933, 1928, 1923, 1920
4 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
4 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1965, 1961, 1957, 1956, 1952, 1942, 1933, 1928, 1923, 1920
40 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1933, 1928, 1923, 1920
41 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
41 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1937, 1933, 1928, 1923, 1920
42 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
42 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1933, 1928, 1923, 1920
44 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
44 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
45 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1942, 1937, 1933, 1923, 1920

FINDINGS

Address Researched	Address Not Identified in Research Source
48 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
5 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
5 I PKY	2013, 2008, 2005, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
5 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
6 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
6 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1970, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
68 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
7 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923
7 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920
72 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
78 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
8 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
8 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1965, 1961, 1957, 1956, 1952, 1942, 1923, 1920
801 2ND ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
803 2ND ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
805 2ND ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
807 2ND	2013, 2008, 2005, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
807 2ND ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
809 2ND ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
811 2ND ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
813 2ND	2013, 2008, 2005, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
813 2ND ST	2013, 2008, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
815 2ND	2013, 2008, 2005, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
815 2ND ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920

FINDINGS

Address Researched	Address Not Identified in Research Source
817 2ND	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1933, 1928
817 2ND AVE	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
817 2ND ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1923, 1920
819 2ND ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
821 2ND	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1933, 1928, 1923, 1920
821 2ND ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1923, 1920
823 2ND	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1933, 1928, 1920
823 2ND ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1923, 1920
825 2ND	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1933, 1928, 1923, 1920
827 2ND	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1933, 1928, 1920
827 2ND ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1923, 1920
829 2ND	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1933, 1928, 1920
829 2ND ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1923, 1920
831 2ND	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1923, 1920
831 2ND ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
833 2ND AVE	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
835 2 F	2013, 2008, 2005, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
849 2ND AVE	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
851 2ND ST	2013, 2008, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
855 FRONT ST	2013, 2008, 2005, 1999, 1995, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
857 2ND AVE	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
871 2ND AVE	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
9 I	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1937, 1933, 1928, 1923, 1920
9 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1970, 1965, 1961, 1957, 1956, 1952, 1942, 1928, 1923, 1920

FINDINGS

Address Researched	Address Not Identified in Research Source
900 2 F	2013, 2008, 2005, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
900 2ND	2013, 2008, 2005, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1923, 1920
900 2ND AVE	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
900 2ND ST	2013, 2008, 1999, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
900 2ND ST	2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
902 2 F	2013, 2008, 2005, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
902 2ND	2013, 2008, 2005, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1923, 1920
902 2ND ST	2013, 2008, 1999, 1995, 1991, 1982, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
904 2ND ST	2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1966, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920
98 I ST	2013, 2008, 2005, 1999, 1995, 1991, 1982, 1980, 1975, 1970, 1965, 1961, 1957, 1956, 1952, 1947, 1942, 1937, 1933, 1928, 1923, 1920

INITIAL SITE ASSESSMENT
I STREET BRIDGE REPLACEMENT PROJECT
Sacramento, California and
West Sacramento, California

APPENDIX E

EDR Radius Report (2015)

I Street Bridge
I Street/Jibboom Street
Sacramento, CA 95814

Inquiry Number: 4267185.2s
April 16, 2015

The EDR Radius Map™ Report

Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

GeoCheck - Not Requested

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

I STREET/JIBBOOM STREET
SACRAMENTO, CA 95814

COORDINATES

Latitude (North):	38.5886000 - 38° 35' 18.96''
Longitude (West):	121.5063000 - 121° 30' 22.68''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	630094.4
UTM Y (Meters):	4271975.5
Elevation:	0 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	38121-E5 SACRAMENTO WEST, CA
Most Recent Revision:	1980
East Map:	38121-E4 SACRAMENTO EAST, CA
Most Recent Revision:	1980

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20120628
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
I STREET/JIBBOOM STREET
SACRAMENTO, CA 95814

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	205 2ND STREET	205 2ND STREET	US BROWNFIELDS, FINDS	Higher	1 ft.
A2	MONITORING STATION	3RD & B ST	FINDS	Higher	1 ft.
B3	PARKINSON W A	521 C ST	EDR US Hist Auto Stat	Higher	1 ft.
C4	SUNG LEE	223 3RD ST	EDR US Hist Cleaners	Higher	1 ft.
A5		3RD ST BETWEEN A & B	CA CHMIRS	Higher	1 ft.
A6	W SAC LIGHTHOUSE PUM	310 B ST	CA UST	Higher	1 ft.
D7	YOLO CO PUBLIC WORKS	4TH ST & B ST	CA RGA LUST	Higher	1 ft.
D8	YOLO CO PUBLIC WORKS	213 4TH ST	CA UST	Higher	1 ft.
D9	YOLO COUNTY GENERAL	213 -4TH ST	CA HAZNET	Higher	1 ft.
B10	GOLDEN EAGLE GARAGE	519 C ST	CA UST	Higher	1 ft.
B11	FORMER HUDSON	500 C ST	CA HIST CORTESE, CA LUST	Higher	1 ft.
B12	HUDSON (#138)	500 C ST	CA HIST UST	Higher	1 ft.
E13	MARTINEZ S GULF SERV	424 C STREET	EDR US Hist Auto Stat	Higher	1 ft.
E14	WEST SACRAMENTO REDE	424 C ST	CA HAZNET	Higher	1 ft.
B15	FORMER HUDSON OIL ST	500 C STREET	CA RGA LUST	Higher	1 ft.
B16	COLE S SHELL SERVICE	500 C STREET	EDR US Hist Auto Stat	Higher	1 ft.
B17	FORMER HUDSON	500 C ST	CA RGA LUST	Higher	1 ft.
B18	FORMER HUDSON (CLOSE	500 C ST	CA RGA LUST	Higher	1 ft.
B19	ON THE BALL GRAPHICS	500 C ST	CA UST	Higher	1 ft.
D20	YOLO CO PUBLIC WORKS	4TH ST & B ST	CA LUST	Higher	1 ft.
F21	COMMUN. CENTER	111 BERCUT DR	CA HIST CORTESE, CA LUST, CA Sacramento Co. CS, CA...	Higher	1 ft.
F22	COMMUN. CENTER	111 BERCUT DR	CA RGA LUST	Higher	1 ft.
F23	CITY OF SACRAMENTO	101 BERCUT DR	CA CHMIRS, CA Sacramento Co. ML	Higher	1 ft.
F24	SACRAMENTO RIVER WAT	101 BERCUT DR	CA HIST UST	Higher	1 ft.
F25	COMMUNICATIONS CENTE	111 BERCUT DRIVE	CA RGA LUST	Higher	1 ft.
F26	COMMUN. CENTER (CLOS	111 BERCUT DR	CA RGA LUST	Higher	1 ft.
F27	COMMUNICATION CENTER	111 BERCUT DR	CA FID UST, CA SWEEPS UST	Higher	1 ft.
F28	SACRAMENTO COMMUNICA	111 BERCUT DR	CA UST	Higher	1 ft.
F29	COMMUNICATION CENTER	111 BERCUT DR	CA HIST UST	Higher	1 ft.
F30	CITY OF SACRAMENTO	101 BERCUT	CA HAZNET	Higher	1 ft.
D31	YOLO CO PUBLIC WORKS	4TH ST/B ST	CA RGA LUST	Higher	1 ft.
D32	YOLO COUNTY PUBLIC W	4TH ST/B ST	CA RGA LUST	Higher	1 ft.
D33	YOLO CO PUBLIC WORKS	4TH ST & B ST	CA RGA LUST	Higher	1 ft.
D34	YOLO CO PUBLIC WORKS	4TH ST & B ST	CA HIST CORTESE, CA LUST	Higher	1 ft.
35	BRODERICK CORPORATIO	FOURTH STREET AT "B"	CA HIST UST	Higher	1 ft.
F36	SACRAMENTO RIVER WAT	101 BERCUTT DR.	RMP	Higher	1 ft.
F37	SACRAMENTO FILTRATIO	101 BERCUT	RCRA-SQG, FINDS	Higher	1 ft.
D38		422 B STREET #2	CA CHMIRS	Higher	1 ft.
D39		422 B. ST	ERNS	Higher	1 ft.

MAPPED SITES SUMMARY

Target Property Address:
I STREET/JIBBOOM STREET
SACRAMENTO, CA 95814

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
G40	CAPITOL PLATING - W	319 3RD ST	CA UST	Higher	1 ft.
G41	319 3RD STREET	319 3RD STREET	US BROWNFIELDS, FINDS	Higher	1 ft.
G42	FOSTER CHAS	319 3RD ST	EDR US Hist Auto Stat	Higher	1 ft.
G43	AVANCED GIO ENVIRONM	319 3RD ST	CA HAZNET	Higher	1 ft.
G44	CAPITOL PLATING CORP	319 3RD STREET	CA Cortese, CA SLIC, CA HIST UST, CA RESPONSE, CA...	Higher	1 ft.
G45	WASHINGTON FIREHOUSE	317 3RD STREET	US BROWNFIELDS, FINDS	Higher	1 ft.
C46	CITY OF WEST SACRAME	305 3RD ST	CA HAZNET	Higher	1 ft.
G47	FIREHOUSE BLOCK SITE	325 3RD STREET	US BROWNFIELDS, FINDS	Higher	1 ft.
G48	THRIFTY CLEANERS	322 3RD ST	EDR US Hist Cleaners	Higher	1 ft.
G49	STOCKTON PLAT. INC D	319 3RD ST	RCRA-SQG, FINDS	Higher	1 ft.
H50		2 ND & D STREET	CA CHMIRS	Higher	1 ft.
H51	BRYSON DOUGLAS	211 D ST	EDR US Hist Cleaners	Higher	1 ft.
H52	SING LEE	424 2ND ST	EDR US Hist Cleaners	Higher	1 ft.
53	C & J LAUNDROMAT	423 3RD ST	EDR US Hist Cleaners	Higher	1 ft.
G54		3RD AND D STREET	CA CHMIRS	Higher	1 ft.
55	SING LEE	424 2D ST	EDR US Hist Cleaners	Higher	1 ft.
G56	CAPITOL PLATING	319 3RD STREET	US BROWNFIELDS	Higher	1 ft.
G57	CITY OF WEST SACRAME	320 2ND ST	CA HAZNET	Higher	1 ft.
G58	FIREHOUSE BLOCK SITE	320 2ND STREET	US BROWNFIELDS, FINDS	Higher	1 ft.
C59	E & B AUTO SALES	301 C STREET	EDR US Hist Auto Stat	Higher	1 ft.
E60	GARY'S SERVICE CASE	427 C ST	CA RGA LUST	Higher	1 ft.
E61	GARY'S SERVICE	427 C ST	CA UST	Higher	1 ft.
E62	GARY'S MOWHAWK SERVI	427 C STREET	CA RGA LUST	Higher	1 ft.
E63	GARY'S MOWHAWK SERVI	427 C STREET	CA HIST CORTESE, CA LUST	Higher	1 ft.
E64	ELMER'S SERVICE STAT	427 C ST	CA HIST UST	Higher	1 ft.
E65	GARY'S MOHAWK STATIO	427 C STREET	FINDS	Higher	1 ft.
E66	ELMER'S SERVICE	427 C ST	CA HIST UST	Higher	1 ft.
E67	CITY OF WEST SACRAME	427 C ST	CA HAZNET	Higher	1 ft.
E68	SHEA T H	427 C ST	EDR US Hist Auto Stat	Higher	1 ft.
E69	GARY'S SERVICE	427 C ST	CA RGA LUST	Higher	1 ft.
C70	LEHRER VACANT LOT	317-319 C ST	CA UST	Higher	1 ft.
C71	DORRIS SHELL SERVICE	300 3RD ST	EDR US Hist Auto Stat	Higher	1 ft.
B72	STORM DRAINAGE PUMP	326 5TH STREET	CA UST	Higher	1 ft.
C73		3RD & C ST.	CA CHMIRS	Higher	1 ft.
C74	CITY OF WEST SACRAME	350 C ST	CA HAZNET	Higher	1 ft.
E75	GARY'S SERVICE	427 C STREET	CA RGA LUST	Higher	1 ft.
E76	GARY'S MOWHAWK SERVI	427 C STREET	CA LUST	Higher	1 ft.
C77	THIRD & C STREET LLC	281 3RD ST	CA HAZNET	Higher	1 ft.
E78	BROWNS SERVICE	421 C STREET	EDR US Hist Auto Stat	Higher	1 ft.

MAPPED SITES SUMMARY

Target Property Address:
I STREET/JIBBOOM STREET
SACRAMENTO, CA 95814

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MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
79	CITY OF SACRAMENTO -	JIBBOOM ST BRIDGE @	CA HAZNET	Higher	1 ft.
H80	CRENSHAW CLYDE	442 2ND ST	EDR US Hist Auto Stat	Higher	12, 0.002, SW
I81	SING CHONG	904 2ND ST	EDR US Hist Cleaners	Higher	167, 0.032, SSE
J82	UP, DOWNTOWN SAC - L	401 I STREET	CA HIST Cal-Sites	Higher	167, 0.032, SE
J83	SP SACRAMENTO RAIL Y	401 I ST	CA FID UST, CA SWEEPS UST	Higher	167, 0.032, SE
J84	SACRAMENTO (P&M)	401 I ST	CA HIST UST	Higher	167, 0.032, SE
J85	SOUTHERN PACIFIC RAI	401 I ST	CA Sacramento Co. CS	Higher	167, 0.032, SE
J86	SP, SAC - SAND PILES	401 I STREET	CA HIST Cal-Sites	Higher	167, 0.032, SE
J87	SACRAMENTO LOCOMOTIV	401 I ST	CA HIST UST	Higher	167, 0.032, SE
J88	SP, SAC - BATTERY SH	401 I STREET	CA HIST Cal-Sites	Higher	167, 0.032, SE
J89	AMTRAK DEPOT	401 I ST	RCRA-LQG	Higher	167, 0.032, SE
J90	UNION PACIFIC SACRAM	501 JIBBOOM ST	RCRA-TSDF, CERC-NFRAP, CORRACTS, RCRA-SQG, RAATS,	Higher	167, 0.032, SE
J91	UP, DOWNTOWN SAC - N	401 I STREET	CA HIST Cal-Sites, CA CHMIRS	Higher	167, 0.032, SE
J92	SP, SAC - SACRAMENTO	401 I STREET	CA HIST Cal-Sites	Higher	167, 0.032, SE
J93	UP, DOWNTOWN SAC - C	401 I STREET	CA NPDES, CA Cortese, CA HIST CORTESE, CA LUST, CA...	Higher	167, 0.032, SE
I94	CA STATE RAILROAD MU	111 I ST	CA Sacramento Co. ML	Higher	178, 0.034, SSE
I95	BOCK F E	114 I ST	EDR US Hist Auto Stat	Higher	188, 0.036, SSE
J96	SP, SAC. - BATTERY S	401 "I" STREET	CA BOND EXP. PLAN	Higher	195, 0.037, SE
J97	SP, SAC.-LOCOMOTIVE	401 "I" STREET	CA BOND EXP. PLAN	Higher	195, 0.037, SE
J98	SP, SAC. - PONDS & D	401 "I" STREET	CA BOND EXP. PLAN	Higher	195, 0.037, SE
I99	VALLEY CLEANERS	907 2ND ST	EDR US Hist Cleaners	Higher	207, 0.039, SSE
I100	SHIRASAGO BENJ	911 2ND ST	EDR US Hist Cleaners	Higher	223, 0.042, SSE
K101	NINA'S DELI	316 6TH ST	CA UST	Higher	230, 0.044, West
K102	JOHNNIE S CHEVRON SE	606 SACRAMENTO ST	EDR US Hist Auto Stat	Higher	233, 0.044, West
I103	SUEY K CLEANING & LA	922 2ND ST	EDR US Hist Cleaners	Higher	253, 0.048, SSE
K104	SWANSON S CLEANERS S	620 SACRAMENTO	EDR US Hist Cleaners	Higher	293, 0.055, West
J105	SUSD	425 I ST	CA Sacramento Co. CS	Higher	294, 0.056, SE
L106	UP, DOWNTOWN SAC - M	400 I STREET	EDR MGP	Higher	403, 0.076, SE
L107	DEPOT AUTO SERVICE	400 I ST	EDR US Hist Auto Stat	Higher	403, 0.076, SE
L108	UP, DOWNTOWN SAC - M	400 I STREET	CA Cortese, CA RESPONSE, CA ENVIROSTOR	Higher	403, 0.076, SE
L109	CATHAY SERVICE STATI	430 I ST	EDR US Hist Auto Stat	Higher	417, 0.079, SE
M110	CA STATE RAILROAD MU	501 JIBBOOM ST	CA Sacramento Co. ML, CA ENVIROSTOR	Higher	432, 0.082, NNE
M111	SACRAMENTO RAILYARDS	501 JIBBOOM ST	RCRA-LQG	Higher	432, 0.082, NNE
N112	RALEY'S LANDING	500 E ST	CA UST	Higher	512, 0.097, WSW
N113	OLD TRAILWAYS PROP	500 E ST	CA HIST CORTESE, CA LUST, CA LOS ANGELES CO. HMS	Higher	512, 0.097, WSW
N114	ON THE BALL GRAPHICS	500 5TH ST	CA HIST CORTESE, CA LUST	Higher	519, 0.098, WSW
N115	PACIFIC TRAILWAYS	520 E ST	CA FID UST, CA SWEEPS UST	Higher	531, 0.101, WSW
N116	PACIFIC TRAILWAYS	520 E STREET	CA HIST UST	Higher	531, 0.101, WSW
O117	SAM LIM	315 J ST	EDR US Hist Cleaners	Higher	571, 0.108, SSE

MAPPED SITES SUMMARY

Target Property Address:
I STREET/JIBBOOM STREET
SACRAMENTO, CA 95814

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MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
O118	SAM S LAUNDRY & DRY	304 J ST	EDR US Hist Cleaners	Higher	578, 0.109, SSE
119	SKELLY WM	611 WILLIAMS AVE	EDR US Hist Auto Stat	Higher	588, 0.111, WNW
P120	LEE SAM	225 J ST	EDR US Hist Cleaners	Higher	590, 0.112, SSE
P121	MIRO LAURENT	207 J ST	EDR US Hist Cleaners	Higher	593, 0.112, SSE
P122	FLASH 1 HR PHOTO	127 J ST	CA Sacramento Co. ML	Higher	596, 0.113, SSE
P123	FLASH ONE HOUR PHOTO	127 J ST	RCRA-SQG, FINDS, CA HAZNET	Higher	596, 0.113, SSE
P124	HOP WO LAUNDRY	212 J ST	EDR US Hist Cleaners	Higher	602, 0.114, SSE
P125	WAH HOP	204 J ST	EDR US Hist Cleaners	Higher	603, 0.114, SSE
N126	BOUGHTON W S	520 5TH ST	EDR US Hist Auto Stat	Higher	611, 0.116, WSW
127	DELTA KING	1000 FRONT ST	CA Sacramento Co. ML	Higher	633, 0.120, South
128	JOHNNIE S CHEVRON SE	660 SACRAMENTO ST	EDR US Hist Auto Stat	Higher	636, 0.120, West
O129	HOY-BIN AUTO SERVICE	331 J ST	EDR US Hist Auto Stat	Higher	650, 0.123, SSE
O130	FRIEDMAN ISADORE	1019 3RD ST	EDR US Hist Cleaners	Higher	671, 0.127, SSE
O131	LEE S ELLEN LAUNDRY	1021 3RD ST	EDR US Hist Cleaners	Higher	678, 0.128, SSE
Q132	EMPTY LOT	4TH/J ST	CA Sacramento Co. ML	Higher	694, 0.131, SSE
Q133	LEE IRENE MRS	902 4TH ST	EDR US Hist Cleaners	Higher	698, 0.132, SSE
Q134		403 J ST	EDR US Hist Cleaners	Higher	701, 0.133, SSE
Q135	WAH LUN	908 4TH ST	EDR US Hist Cleaners	Higher	701, 0.133, SSE
Q136	WEISBERG DAVID	402 J ST	EDR US Hist Cleaners	Higher	709, 0.134, SSE
P137		1008 2ND ST	EDR US Hist Auto Stat	Higher	727, 0.138, SSE
R138	W SAC PUBLIC WORKS	201 F ST	CA UST	Higher	735, 0.139, SSW
R139	RAGSDALE J B	601 2ND ST	EDR US Hist Auto Stat	Higher	736, 0.139, SSW
R140	BRODERICK AUTO SERVI	219 F ST	EDR US Hist Auto Stat	Higher	750, 0.142, SSW
Q141	JAY STREET LAUNDRY	420 J ST	EDR US Hist Cleaners	Higher	751, 0.142, SSE
Q142	D & A PROPERTIES	429 J ST	CA Sacramento Co. ML	Higher	764, 0.145, SSE
Q143	C.O.P.Y.	1012 4TH ST	CA Sacramento Co. ML	Higher	766, 0.145, SSE
Q144	WRIGHT H A	1007 4TH ST	EDR US Hist Cleaners	Higher	767, 0.145, SSE
Q145	FONG MING	1016 4TH ST	EDR US Hist Cleaners	Higher	769, 0.146, SSE
Q146	FONG MING	1009 4TH ST	EDR US Hist Cleaners	Higher	769, 0.146, SSE
Q147	PARKING LOT D 510 D	428 J ST	CA LUST, CA Sacramento Co. ML	Higher	772, 0.146, SSE
Q148		428 J ST	EDR US Hist Auto Stat	Higher	772, 0.146, SSE
Q149	SACRAMENTO PRINTERY	428 J ST # 110	CA Sacramento Co. ML	Higher	772, 0.146, SSE
Q150	CHEW JACK	1019 4TH ST	EDR US Hist Cleaners	Higher	775, 0.147, SSE
S151	SOUTHSIDE VENDING	848 5TH ST	CA SWEEPS UST	Higher	789, 0.149, SE
S152	CITY OF SACRAMENTO P	801 5TH ST	CA HIST UST	Higher	800, 0.152, SE
S153	SAFETY GARAGE	801 5TH ST	CA HIST CORTESE, CA LUST, CA Sacramento Co. CS, CA...	Higher	800, 0.152, SE
S154	FEDERAL COURTHOUSE -	5TH AND I STREETS	CA DEED, CA VCP, CA ENVIROSTOR	Higher	810, 0.153, SE
S155	FEDERAL COURTHOUSE -	5TH AND I ST	CA HIST CORTESE	Higher	810, 0.153, SE
156	YANCEY FRED	308 F ST	EDR US Hist Auto Stat	Higher	816, 0.155, SW

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SACRAMENTO, CA 95814

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MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
S157	ROBERT T. MATSUI US	501 I ST	CA Sacramento Co. ML	Higher	821, 0.155, SE
S158	LOTUS LAUNDRY	918 5TH ST	EDR US Hist Cleaners	Higher	826, 0.156, SE
Q159	FONG LEE	1106 4TH ST	EDR US Hist Cleaners	Higher	827, 0.157, SSE
Q160	CECCARELLI LOUIS	1108 4TH ST	EDR US Hist Auto Stat	Higher	828, 0.157, SSE
S161	COMMERCIAL GARAGE RE	915 5TH ST	EDR US Hist Auto Stat	Higher	830, 0.157, SE
S162	MYRICK A L	504 I ST	EDR US Hist Cleaners	Higher	838, 0.159, SE
P163	GOLD STAR LAUNDRY	1027 2ND ST	EDR US Hist Cleaners	Higher	851, 0.161, SSE
P164	FONG WEE	1026 2ND ST	EDR US Hist Cleaners	Higher	852, 0.161, SSE
P165	O'GRADY'S OLD TIME P	1026 2ND ST	CA Sacramento Co. ML	Higher	852, 0.161, SSE
P166	YOCUM J M	1028 2ND ST	EDR US Hist Cleaners	Higher	857, 0.162, SSE
T167	HOLIDAY INN CAPITOL	300 J ST	CA Sacramento Co. ML	Higher	872, 0.165, SSE
168	JIBBOOM JUNKYARD	I-5 AND JIBBOOM STRE	CA BOND EXP. PLAN	Higher	884, 0.167, North
S169	SELLINGER G P	521 I ST	EDR US Hist Auto Stat	Higher	897, 0.170, SE
S170	DAL PORTO DOMENIC	523 I ST	EDR US Hist Auto Stat	Higher	904, 0.171, SE
S171	DAL PORTO DOMINIC	522 I ST	EDR US Hist Auto Stat	Higher	906, 0.172, SE
S172	THOMPSON S CHEVRON S	531 I STREET	EDR US Hist Auto Stat	Higher	934, 0.177, SE
S173	ALPHA GRAPHICS PRINT	530 I ST	CA Sacramento Co. ML	Higher	936, 0.177, SE
U174	ALPHA GRAPHICS	501 J ST 100	CA Sacramento Co. ML	Higher	976, 0.185, SE
U175	SUTTER PRINTING	501 J ST	CA Sacramento Co. ML, CA HAZNET	Higher	976, 0.185, SE
V176	CHONG HOP	121 K ST	EDR US Hist Cleaners	Higher	977, 0.185, South
U177	BROWN J L	1004 5TH ST	EDR US Hist Cleaners	Higher	986, 0.187, SE
U178	GEE LAUNDRY	504 J ST	EDR US Hist Cleaners	Higher	1002, 0.190, SE
179		550 7TH ST	EDR US Hist Cleaners	Higher	1009, 0.191, WSW
W180	TURNER LAND COMPANY	800 SACRAMENTO AVENU	CA LUST	Higher	1009, 0.191, West
W181	TURNER LAND COMPANY	8TH AND SACRAMENTO A	CA LUST	Higher	1009, 0.191, West
U182	ACME CLEANERS AND LA	1011 5TH ST	EDR US Hist Cleaners	Higher	1011, 0.191, SE
V183	SHIMOTORI MINAO	205 K ST	EDR US Hist Cleaners	Higher	1014, 0.192, South
U184	VETERANS CLEANERS	511 J STREET	EDR US Hist Cleaners	Higher	1016, 0.192, SE
V185	FORT SUTTER LAUNDERL	243 K STREET	EDR US Hist Cleaners	Higher	1016, 0.192, South
T186	MILLER JOHN	307 K ST	EDR US Hist Cleaners	Higher	1020, 0.193, SSE
U187	OCK LEE HAND LAUNDRY	1021 5TH ST	EDR US Hist Cleaners	Higher	1041, 0.197, SE
U188	SPOTLESS CLEANERS	1023 5TH ST	EDR US Hist Cleaners	Higher	1047, 0.198, SE
U189	COHN HARRY	522 J ST	EDR US Hist Cleaners	Higher	1059, 0.201, SE
U190	FONG SING HAND LAUND	527 J STREET	EDR US Hist Cleaners	Higher	1067, 0.202, SE
V191	MCGEE'S OLD TIME PHO	1107 FRONT ST	CA Sacramento Co. ML	Higher	1071, 0.203, South
X192	GOLDEN DRAGON RESTAU	1115 FRONT ST	CA Sacramento Co. ML	Higher	1103, 0.209, South
X193	DAY'S OF 49	1115 FRONT ST #11	CA Sacramento Co. ML	Higher	1103, 0.209, South
194	EAGLE CLEANERS	1125 3RD ST	EDR US Hist Cleaners	Higher	1107, 0.210, SSE
Y195	MACY'S	414 K ST	CA Sacramento Co. ML	Higher	1126, 0.213, SSE

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Y196	NICHOLOPOULOS K A	423 K ST	EDR US Hist Cleaners	Higher	1130, 0.214, SSE
Y197	PAPPAS LOUIS	422 K ST	EDR US Hist Cleaners	Higher	1139, 0.216, SSE
Y198	BOYLE BROS	429 K ST	EDR US Hist Cleaners	Higher	1139, 0.216, SSE
Z199	GRAIWER PROPERTY	E, F, 7TH & 8TH STS	CA SLIC	Higher	1143, 0.216, WSW
U200	STATE OF CA DEPT OF	560 J ST 170-B	CA Sacramento Co. ML	Higher	1184, 0.224, SE
AA201	FIRST UNION BANK C O	707 3RD ST	RCRA-SQG, CA HAZNET, CA EMI	Higher	1186, 0.225, SW
AB202	CITY OF SACTO-HALL O	816 6TH ST	CA Sacramento Co. ML	Higher	1199, 0.227, SE
AC203	RIVERVIEW PLAZA	600 I ST	CA UST, CA Sacramento Co. ML	Higher	1207, 0.229, SE
AB204	SMUD STATION A	6TH AND H STREET	RCRA-SQG	Higher	1209, 0.229, SE
AA205	VACANT PROPERTY	710-712 3RD ST	CA UST	Higher	1213, 0.230, SW
AC206	HING YEE	909 6TH ST	EDR US Hist Cleaners	Higher	1214, 0.230, SE
AB207	SMUD STATION A SUBST	6TH/H ST	CA Sacramento Co. ML	Higher	1216, 0.230, SE
208	PACIFIC BELL	570 J ST	RCRA NonGen / NLR, FINDS, CA Sacramento Co. ML	Higher	1218, 0.231, SE
AC209	DAGUE A C	921 6TH ST	EDR US Hist Cleaners	Higher	1223, 0.232, SE
AD210	CHUNGKING LAUNDRY	1124 2ND ST	EDR US Hist Cleaners	Higher	1238, 0.234, South
Z211	LINDEMAN BROS., INC.	800 E ST	CA HIST UST	Higher	1241, 0.235, WSW
Z212	LINDEMAN BROTHERS	800 E ST	CA UST	Higher	1241, 0.235, WSW
AC213	ANDERSON F G	610 I ST	EDR US Hist Auto Stat	Higher	1253, 0.237, SE
AD214	KING G L	1126 2ND ST	EDR US Hist Cleaners	Higher	1255, 0.238, South
AD215	MATORIAN ABR	1127 2ND ST	EDR US Hist Cleaners	Higher	1258, 0.238, South
AD216	JENNINGS CHAS	1130 2ND ST	EDR US Hist Auto Stat	Higher	1265, 0.240, South
AA217	LUNG CHONG LAUNDRY	718 3RD ST	EDR US Hist Cleaners	Higher	1265, 0.240, SW
Z218	SAN JOAQUIN MOTOR TR	805 E ST	CA UST	Higher	1269, 0.240, WSW
Z219	PETERS TRUCK LINES#	805 E ST	RCRA NonGen / NLR, FINDS, CA HIST UST	Higher	1269, 0.240, WSW
AE220	SUPER 8 EXECUTIVE SU	216 BANNON ST	CA Sacramento Co. ML	Higher	1271, 0.241, NNE
AE221	DOSSMAN BROS REPAIR	217 BANNON ST	EDR US Hist Auto Stat	Higher	1281, 0.243, NNE
AC222	BECHTEL CONSTRUCTION	621 I ST	RCRA-SQG, FINDS	Higher	1288, 0.244, SE
AB223	OLD SACRAMENTO JAIL	620 H ST	CA FID UST, CA SWEEPS UST, CA Sacramento Co. ML	Higher	1301, 0.246, SE
AB224	COUNTY MAIN JAIL	620 "H" STREET	CA HIST UST	Higher	1306, 0.247, SE
AF225	ARTENIAN GEO	513 K ST	EDR US Hist Cleaners	Higher	1316, 0.249, SSE
AB226	CITY OF SACRAMENTO	625 H ST	CA Sacramento Co. ML	Higher	1319, 0.250, SE
AF227	SHRA LOT D	510 DOWNTOWN PLAZA	CA Sacramento Co. CS	Higher	1320, 0.250, SSE
AB228	FORMER CITY OF SACRA	631 H STREET	CA LUST, CA Sacramento Co. CS, CA Sacramento Co....	Higher	1342, 0.254, SE
AG229	JIBBOOM JUNKYARD SUP	240 JIBBOOM ST	CONSENT, PRP	Higher	1379, 0.261, North
AG230	JIBBOOM JUNKYARD	240 - 260 JIBBOOM ST	Delisted NPL, CERCLIS, RCRA-SQG, US ENG CONTROLS,...	Higher	1379, 0.261, North
AG231	OLD PG&E PLANT	240 JIBBOOM ST	CA HIST CORTESE, CA LUST, CA SLIC, CA Sacramento...	Higher	1379, 0.261, North
AG232	JIBBOOM JUNKYARD	240-260 JIBBOOM STRE	CA HIST Cal-Sites, CA ENVIROSTOR	Higher	1389, 0.263, North
AC233	SACRAMENTO COUNTY JA	651 I STREET	CA LUST	Higher	1400, 0.265, SE
AC234	SACRAMENTO COUNTY JA	651 I STREET	CA LUST, CA Sacramento Co. CS, CA Sacramento Co....	Higher	1400, 0.265, SE

MAPPED SITES SUMMARY

Target Property Address:
I STREET/JIBBOOM STREET
SACRAMENTO, CA 95814

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
235	MILNE TRUCKING	830 E ST	CA HIST CORTESE, CA LUST	Higher	1426, 0.270, West
AH236	RIVER ONE PROPERTY	765 3RD STREET	US BROWNFIELDS, FINDS	Higher	1507, 0.285, SSW
AG237	TEXACO SS (FORMER)	226 JIBBOOM ST	CA HIST CORTESE, CA LUST, CA Sacramento Co. CS, CA...	Higher	1610, 0.305, North
AG238	SHELL #204-6678-9003	225 JIBBOOM ST	CA HIST CORTESE, CA LUST, CA Sacramento Co. CS	Higher	1638, 0.310, North
AI239	ARCO SERVICE STATION	222 JIBBOOM STREET	CA Notify 65	Higher	1664, 0.315, North
AI240	ARCO #6168	222 JIBBOOM ST	CA LUST, CA UST	Higher	1664, 0.315, North
AI241	ARCO #6168	222 JIBBOOM	CA HIST CORTESE, CA LUST, CA Sacramento Co. CS, CA...	Higher	1664, 0.315, North
AJ242	DOWNTOWN PARKING GAR	725 7TH ST	CA LUST	Higher	1698, 0.322, ESE
AJ243	DOWNTOWN PARKING GAR	725 7TH ST	CA LUST, CA Sacramento Co. CS, CA HIST UST, CA...	Higher	1698, 0.322, ESE
AH244	TEXACO SERVICE STATI	WEST CAPITOL & THIRD	CA LUST	Higher	1718, 0.325, SW
AK245	SCHETTER ELECTRIC	471 BANNON STREET	CA LUST	Higher	1745, 0.330, NE
AK246	SCHETTER ELECTRIC	471 BANNON STREET	CA LUST, CA Sacramento Co. CS, CA Sacramento Co....	Higher	1745, 0.330, NE
AJ247	SHERIFF ADM BLDG	711 G ST	CA HIST CORTESE, CA LUST, CA Sacramento Co. CS, CA...	Higher	1780, 0.337, ESE
AK248	MATHESON FAST FREIGH	455 BANNON ST	CA NPDES, CA HIST CORTESE, CA LUST, CA Sacramento...	Higher	1792, 0.339, NE
AL249	THE SACRAMENTO UNION	301 CAPITOL MALL	CA SLIC, CA HIST UST	Higher	1823, 0.345, South
AL250	CAPITOL GATEWAY	301 CAPITOL MALL	CA SLIC	Higher	1823, 0.345, South
251	BECHER, ROBERT W. &	930 CASSELMAN	CA HIST CORTESE	Higher	1839, 0.348, West
AM252	RALEY'S LANDING/PARR	490 WEST CAPITOL AVE	CA LUST	Higher	1848, 0.350, SW
AN253	STERLING TRANSIT	832 F ST	CA HIST CORTESE, CA LUST, CA WDS	Higher	1849, 0.350, WSW
AM254	RALEY'S LANDING/PARR	490 CAPITOL	CA HIST CORTESE	Higher	1849, 0.350, SW
AO255	CARDLUCK SITE (CASE	300 RICHARDS BLVD	CA HIST CORTESE, CA LUST, CA Sacramento Co. CS, CA...	Higher	1864, 0.353, NNE
AO256	PACIFIC MOTOR TRUCKI	300 RICHARDS BLVD	RCRA NonGen / NLR, FINDS, CA LUST, CA FID UST, CA...	Higher	1864, 0.353, NNE
AP257	CONWAY WESTERN EXPRE	900 E ST	CA LUST	Higher	1870, 0.354, West
AP258	CONWAY WESTERN EXPRE	900 E ST	CA NPDES, CA HIST CORTESE, CA LUST	Higher	1870, 0.354, West
AQ259	CONTINENTAL CAN CO	601 7TH ST N	CA HIST CORTESE, CA LUST	Higher	1889, 0.358, ESE
AQ260	COUNTY OF SACRAMENTO	575 7TH ST	CA Sacramento Co. CS, CA Sacramento Co. ML	Higher	1914, 0.363, ESE
AO261	MOTOROLA	301 RICHARDS BLVD	CA HIST CORTESE, CA LUST, CA Sacramento Co. CS, CA...	Higher	1931, 0.366, NNE
AR262	HOLIDAY INN	200 JIBBOOM ST	CA HIST CORTESE, CA LUST, CA Sacramento Co. ML	Higher	1973, 0.374, North
AS263	A-B-C CLEANERS	1120 7TH STREET	CA ENVIROSTOR	Higher	2011, 0.381, SE
AT264	FEDERAL BUILDING - G	801 I ST	CA HIST CORTESE, CA LUST, CA Sacramento Co. CS, CA...	Higher	2016, 0.382, SE
AT265	SACTO HOUSING &	917 8TH ST	CA Sacramento Co. CS, CA Sacramento Co. ML	Higher	2016, 0.382, SE
AR266	LA QUINTA INN	208 JIBBOOM STREET	CERCLIS	Higher	2031, 0.385, North
267	TOWER COURT	706 WEST CAPITAL AVE	CA VCP, CA ENVIROSTOR	Higher	2036, 0.386, SW
AN268	WILLIG FREIGHT LINES	850 F ST	CA LUST, CA UST	Higher	2053, 0.389, WSW
AN269	WILLIG FREIGHT LINES	850 F ST	CA NPDES, CA HIST CORTESE, CA LUST	Higher	2053, 0.389, WSW
270	WELLS FARGO BANK	500 CAPITOL MALL	CA Sacramento Co. CS	Higher	2060, 0.390, SSE
271	CABRERAS RECYCLING	737 SACRAMENTO AVE	CA SWRCY	Higher	2065, 0.391, West
272	LOT X CITY OF SACRAM	0 N ST	CA LUST, CA Sacramento Co. CS	Higher	2109, 0.399, South
273	SACRAMENTO FOODS, IN	424 NORTH 7TH STREET	CA HIST UST, CA CHMIRS, CA ENVIROSTOR	Higher	2137, 0.405, East

MAPPED SITES SUMMARY

Target Property Address:
I STREET/JIBBOOM STREET
SACRAMENTO, CA 95814

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
AU274	RELLES OIL	804 SOUTH RIVER ROAD	CA LUST	Higher	2148, 0.407, SSW
AU275	RELLES OIL	804 SOUTH RIVER ROAD	CA LUST, CA CHMIRS	Higher	2148, 0.407, SSW
AS276	GREYHOUND BUS TERMIN	715 L ST	CA HIST CORTESE, CA LUST, CA Sacramento Co. CS, CA...	Higher	2181, 0.413, SE
AV277	820 WEST CAPITOL AVE	820 WEST CAPITOL AVE	US BROWNFIELDS, FINDS	Higher	2409, 0.456, WSW
AV278	FORMER EXPERIENCE MO	820-824 WEST CAPITOL	CA LUST	Higher	2409, 0.456, WSW
279	TUNE UP MASTERS	1400 5TH ST	CA HIST CORTESE, CA LUST, CA Sacramento Co. CS, CA...	Higher	2423, 0.459, SSE
AV280	THE EXPERIENCE MOTEL	824 WEST CAPITOL AVE	US BROWNFIELDS, FINDS	Higher	2423, 0.459, WSW
AV281	OLD TOWN INN	826 WEST CAPITOL AVE	US BROWNFIELDS, FINDS	Higher	2430, 0.460, WSW
282	SACRAMENTO CITY HALL	915 I ST	CA HIST CORTESE, CA LUST, CA Sacramento Co. CS, CA...	Higher	2463, 0.466, SE
AW283	LOUIE BROTHERS GARAG	805-809 L ST	CA LUST	Higher	2465, 0.467, SE
AW284	JAMES LOUIE	805 L ST	CA Sacramento Co. CS, CA Sacramento Co. ML	Higher	2470, 0.468, SE
AX285	WHALEY PROPERTY	804 SOUTH RIVER ROAD	US BROWNFIELDS, FINDS	Higher	2482, 0.470, SSW
AX286	COAST OIL COMPANY**	801 RIVER RD S	CA SLIC	Higher	2493, 0.472, SSW
AX287	WESTCO TECHNOLOGIES	801 SOUTH RIVER RD.	CA ENVIROSTOR	Higher	2493, 0.472, SSW
AX288	RIVER WALK PROPERTY	SOUTH RIVER ROAD & T	US BROWNFIELDS, FINDS	Higher	2496, 0.473, SSW
AV289	CAPITOL TRAVEL INN	817 WEST CAPITOL AVE	US BROWNFIELDS, FINDS	Higher	2521, 0.477, WSW
290	CALVADA SALES COMPAN	444 RICHARDS BLVD	CA LUST, CA FID UST, CA Sacramento Co. CS, CA...	Higher	2538, 0.481, NE
291	CHEVRON #9-4176	1601 J ST (AKA 925 1	CA HIST CORTESE, CA LUST, CA Sacramento Co. CS, CA...	Higher	2560, 0.485, SE
AY292	FREDERICKSEN TANK LI	850 DELTA LN	CA NPDES, CA HIST CORTESE, CA LUST	Higher	2596, 0.492, SW
AY293	FREDERICKSEN TANK LI	850 DELTA LN	CA LUST, CA WDS	Higher	2596, 0.492, SW
AZ294	SALKEY BROTHERS, INC	500 SEQUOIA PACIFIC	CA Sacramento Co. CS, CA HIST UST, CA CHMIRS, CA...	Higher	2601, 0.493, NE
AZ295	SLAKEY BROS INC	500 SEQUOIA-PACIFIC	CA HIST CORTESE, CA LUST	Higher	2601, 0.493, NE
296	UNION PACIFIC BANNON	NORTH B STREET AND S	CA VCP, CA ENVIROSTOR	Higher	2735, 0.518, ENE
AZ297	BIGGERS INDUSTRIAL G	551 SEQUOIA PACIFIC	CA HIST CORTESE, CA CHMIRS, CA ENVIROSTOR	Higher	2743, 0.520, NE
298	VAN WATERS AND ROGER	850 SOUTH RIVER ROAD	CA HIST CORTESE, CA SLIC, CA ENVIROSTOR	Higher	2905, 0.550, SSW
299	SACRAMENTO STUCCO CO	860 RISKE LANE	CA HIST UST, CA VCP, CA ENVIROSTOR	Higher	3227, 0.611, SW
300	SUNSHINE LAUNDRY AND	820 MERKLEY AVENUE	CA ENVIROSTOR	Higher	3439, 0.651, WSW
301	BURNETT & SONS	11TH & C STREETS	CA Notify 65	Higher	3571, 0.676, East
302	MATHER STORAGE ANX (		CA ENVIROSTOR	Higher	3636, 0.689, SSE
BA303	SACRAMENTO ENGINEERI		FUDS	Higher	3726, 0.706, SSW
BA304	SACRAMENTO ENGINEERI		CA ENVIROSTOR	Higher	3732, 0.707, SSW
BB305	SACRAMENTO HOUSING &	1920 FRONT STREET	CA HIST Cal-Sites	Higher	3816, 0.723, South
306	PROPOSED K-8 FUNDAME	NW CORNER OF LIGHTHO	CA SCH, CA ENVIROSTOR	Higher	3825, 0.724, WNW
BB307	SACRAMENTO HOUSING &	1920 FRONT STREET	CA HIST CORTESE, CA LUST, CA Sacramento Co. CS, CA...	Higher	3839, 0.727, South
308	MCCURRY COMPANIES	1231 K ST	CA ENVIROSTOR	Higher	3884, 0.736, SE
309	H&H CLEANERS	1231 MERKLEY AVE	CA SLIC, CA ENVIROSTOR	Higher	4001, 0.758, WSW
310	CALTRANS HEADQUARTER	1120 N ST	CA FID UST, CA SWEEPS UST, CA HWP	Higher	4013, 0.760, SE
311	RICE GROWERS ASSOCIA	901 SOUTH RIVER ROAD	CA EMI, CA ENVIROSTOR	Higher	4034, 0.764, SW
312	TOMLIN'S SUNSHINE CL	612 MICHIGAN BLVD	CA ENVIROSTOR	Higher	4264, 0.808, WSW

MAPPED SITES SUMMARY

Target Property Address:
I STREET/JIBBOOM STREET
SACRAMENTO, CA 95814

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
BC313	PG&E - SACRAMENTO SI	2000 FRONT STREET	CA BOND EXP. PLAN, CA Cortese, CA HIST CORTESE, CA...	Higher	4401, 0.834, South
BC314	PG&E - SACRAMENTO SI	2000 FRONT STREET	CA HIST Cal-Sites	Higher	4401, 0.834, South
BC315	PG AND E SACRAMENTO	2000 FRONT STREET	EDR MGP	Higher	4401, 0.834, South
316	PAYLESS CLEANERS (2)	1351 MERKLEY AVENUE	CA ENVIROSTOR	Higher	4482, 0.849, WSW
BC317	CALTRANS, I-5 Q STRE	I-5 Q STREET OFF-RAM	CA DEED, CA RESPONSE, CA ENVIROSTOR	Higher	4507, 0.854, South
318	FABRICARE ONE HOUR M	827 JEFFERSON BOULEV	CA ENVIROSTOR	Higher	4627, 0.876, WSW
319	723 S STREET	723 S STREET	CA SLIC, CA Sacramento Co. CS, CA ENVIROSTOR	Higher	4634, 0.878, SSE
BD320	SMUD, FRONT & T STRE	FRONT & T STREETS	CA HIST Cal-Sites, CA DEED, CA RESPONSE, CA...	Higher	4724, 0.895, South
321	SIMS METAL SITE	130 NORTH 12 STREET;	CA Cortese, CA RESPONSE, CA ENVIROSTOR	Higher	4895, 0.927, East
BD322	THE DOCKS AREA SACRA	CITY OF SACRAMENTO R	CA VCP, CA ENVIROSTOR	Higher	4936, 0.935, South
323	SACRAMENTO SIGNAL DE	NORTH 7TH STREET	CA ENVIROSTOR	Higher	4959, 0.939, NE
324	CADA WAREHOUSE REDEV	1108 R STREET	CA VCP, CA Sacramento Co. ML, CA HAZNET, CA...	Higher	5125, 0.971, SSE
325	PACIFIC GAS AND ELEC	101 U STREET	EDR MGP	Higher	5257, 0.996, SSW

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing

Federal RCRA generators list

RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US INST CONTROL ---------- Sites with Institutional Controls
LUCIS ---------- Land Use Control Information System

State and tribal landfill and/or solid waste disposal site lists

CA SWF/LF ---------- Solid Waste Information System

State and tribal leaking storage tank lists

INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

CA AST ---------- Aboveground Petroleum Storage Tank Facilities
INDIAN UST ---------- Underground Storage Tanks on Indian Land
FEMA UST ---------- Underground Storage Tank Listing

State and tribal voluntary cleanup sites

INDIAN VCP ---------- Voluntary Cleanup Priority Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations

ODI ---------- Open Dump Inventory
CA HAULERS ---------- Registered Waste Tire Haulers Listing
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL ---------- Clandestine Drug Labs
CA Toxic Pits ---------- Toxic Pits Cleanup Act Sites
CA CDL ---------- Clandestine Drug Labs
US HIST CDL ---------- National Clandestine Laboratory Register

Local Land Records

LIENS 2 ---------- CERCLA Lien Information
CA LIENS ---------- Environmental Liens Listing

Records of Emergency Release Reports

HMIRS ---------- Hazardous Materials Information Reporting System
CA LDS ---------- Land Disposal Sites Listing
CA MCS ---------- Military Cleanup Sites Listing
CA SPILLS 90 ---------- SPILLS 90 data from FirstSearch

Other Ascertainable Records

DOT OPS ---------- Incident and Accident Data
DOD ---------- Department of Defense Sites
UMTRA ---------- Uranium Mill Tailings Sites
US MINES ---------- Mines Master Index File
TRIS ---------- Toxic Chemical Release Inventory System
TSCA ---------- Toxic Substances Control Act
FTTS ---------- FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS ---------- FIFRA/TSCA Tracking System Administrative Case Listing
SSTS ---------- Section 7 Tracking Systems
PADS ---------- PCB Activity Database System
MLTS ---------- Material Licensing Tracking System
RADINFO ---------- Radiation Information Database
CA UIC ---------- UIC Listing
CA CUPA Listings ---------- CUPA Resources List
CA DRYCLEANERS ---------- Cleaner Facilities
CA WIP ---------- Well Investigation Program Case List
CA ENF ---------- Enforcement Action Listing
INDIAN RESERV ---------- Indian Reservations
SCRD DRYCLEANERS ---------- State Coalition for Remediation of Drycleaners Listing
CA MWMP ---------- Medical Waste Management Program Listing
CA HWT ---------- Registered Hazardous Waste Transporter Database
CA PROC ---------- Certified Processors Database
CA Financial Assurance ---------- Financial Assurance Information Listing
EPA WATCH LIST ---------- EPA WATCH LIST
US FIN ASSUR ---------- Financial Assurance Information
COAL ASH DOE ---------- Steam-Electric Plant Operation Data
US AIRS ---------- Aerometric Information Retrieval System Facility Subsystem
COAL ASH EPA ---------- Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ---------- PCB Transformer Registration Database

EXECUTIVE SUMMARY

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

CA RGA LF..... Recovered Government Archive Solid Waste Facilities List

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal Delisted NPL site list

Delisted NPL: The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may deleted from the NPL where no further response is appropriate.

A review of the Delisted NPL list, as provided by EDR, and dated 12/16/2014 has revealed that there is 1 Delisted NPL site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
JIBBOOM JUNKYARD	***240 - 260 JIBBOOM ST***	***N 1/4 - 1/2 (0.261 mi.)***	***AG230***	***430***

Federal CERCLIS list

CERCLIS: The Comprehensive Environmental Response, Compensation and Liability Information System contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

A review of the CERCLIS list, as provided by EDR, and dated 10/25/2013 has revealed that there are 2 CERCLIS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
JIBBOOM JUNKYARD	***240 - 260 JIBBOOM ST***	***N 1/4 - 1/2 (0.261 mi.)***	***AG230***	***430***
LA QUINTA INN	208 JIBBOOM STREET	N 1/4 - 1/2 (0.385 mi.)	AR266	533

EXECUTIVE SUMMARY

Federal CERCLIS NFRAP site List

CERC-NFRAP: Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

A review of the CERC-NFRAP list, as provided by EDR, and dated 10/25/2013 has revealed that there is 1 CERC-NFRAP site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
UNION PACIFIC SACRAM	***501 JIBBOOM ST***	***SE 0 - 1/8 (0.032 mi.)***	***J90***	***133***

Federal RCRA CORRACTS facilities list

CORRACTS: CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity.

A review of the CORRACTS list, as provided by EDR, and dated 12/09/2014 has revealed that there is 1 CORRACTS site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
UNION PACIFIC SACRAM	***501 JIBBOOM ST***	***SE 0 - 1/8 (0.032 mi.)***	***J90***	***133***

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

A review of the RCRA-TSDF list, as provided by EDR, and dated 12/09/2014 has revealed that there is 1 RCRA-TSDF site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
UNION PACIFIC SACRAM	***501 JIBBOOM ST***	***SE 0 - 1/8 (0.032 mi.)***	***J90***	***133***

EXECUTIVE SUMMARY

Federal RCRA generators list

RCRA-LQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

A review of the RCRA-LQG list, as provided by EDR, and dated 12/09/2014 has revealed that there are 2 RCRA-LQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
AMTRAK DEPOT	401 I ST	SE 0 - 1/8 (0.032 mi.)	J89	131
SACRAMENTO RAILYARDS	501 JIBBOOM ST	NNE 0 - 1/8 (0.082 mi.)	M111	352

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 12/09/2014 has revealed that there are 7 RCRA-SQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SACRAMENTO FILTRATIO	***101 BERCUT***	***0 - 1/8 (0.000 mi.)***	***F37***	***46***
STOCKTON PLAT. INC D	***319 3RD ST***	***0 - 1/8 (0.000 mi.)***	***G49***	***68***
UNION PACIFIC SACRAM	***501 JIBBOOM ST***	***SE 0 - 1/8 (0.032 mi.)***	***J90***	***133***
FLASH ONE HOUR PHOTO	***127 J ST***	***SSE 0 - 1/8 (0.113 mi.)***	***P123***	***361***
FIRST UNION BANK C O	***707 3RD ST***	***SW 1/8 - 1/4 (0.225 mi.)***	***AA201***	***405***
SMUD STATION A	6TH AND H STREET	SE 1/8 - 1/4 (0.229 mi.)	AB204	409
BECHTEL CONSTRUCTION	***621 I ST***	***SE 1/8 - 1/4 (0.244 mi.)***	***AC222***	***422***

Federal institutional controls / engineering controls registries

US ENG CONTROLS: A listing of sites with engineering controls in place.

A review of the US ENG CONTROLS list, as provided by EDR, and dated 09/18/2014 has revealed that there is 1 US ENG CONTROLS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
JIBBOOM JUNKYARD	***240 - 260 JIBBOOM ST***	***N 1/4 - 1/2 (0.261 mi.)***	***AG230***	***430***

EXECUTIVE SUMMARY

Federal ERNS list

ERNS: The Emergency Response Notification System records and stores information on reported releases of oil and hazardous substances. The source of this database is the U.S. EPA.

A review of the ERNS list, as provided by EDR, and dated 09/29/2014 has revealed that there is 1 ERNS site within approximately 0.001 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported	422 B. ST	0 - 1/8 (0.000 mi.)	D39	48

State- and tribal - equivalent NPL

CA RESPONSE: Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

A review of the CA RESPONSE list, as provided by EDR, and dated 03/11/2015 has revealed that there are 8 CA RESPONSE sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CAPITOL PLATING CORP	***319 3RD STREET***	***0 - 1/8 (0.000 mi.)***	***G44***	***53***
Status: Backlog Facility Id: 57340006				
UP, DOWNTOWN SAC - C	***401 I STREET***	***SE 0 - 1/8 (0.032 mi.)***	***J93***	***218***
Status: Certified O&M - Land Use Restrictions Only Status: Active Status: No Further Action Status: Certified Status: Certified / Operation & Maintenance Facility Id: 34360065 Facility Id: 34400004 Facility Id: 60001378 Facility Id: 60001447 Facility Id: 34400008 **Additional key fields are available in the Map Findings section*				
UP, DOWNTOWN SAC - M	***400 I STREET***	***SE 0 - 1/8 (0.076 mi.)***	***L108***	***344***
Status: Active Facility Id: 70000034				
SACRAMENTO HOUSING &	***1920 FRONT STREET***	***S 1/2 - 1 (0.727 mi.)***	***BB307***	***646***
Status: Certified O&M - Land Use Restrictions Only Facility Id: 34240036				
PG&E - SACRAMENTO SI	***2000 FRONT STREET***	***S 1/2 - 1 (0.834 mi.)***	***BC313***	***660***
Status: Active Facility Id: 34490048				
CALTRANS, I-5 Q STRE	***I-5 Q STREET OFF-RAM***	***S 1/2 - 1 (0.854 mi.)***	***BC317***	***702***
Status: Certified O&M - Land Use Restrictions Only Facility Id: 34240037				
SMUD, FRONT & T STRE	***FRONT & T STREETS***	***S 1/2 - 1 (0.895 mi.)***	***BD320***	***712***
AWP Facility Id: 34490057 Status: Certified O&M - Land Use Restrictions Only Facility Id: 34490057				

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SIMS METAL SITE	***130 NORTH 12 STREET;***	***E 1/2 - 1 (0.927 mi.)***	***321***	***725***
Status: Active				
Facility Id: 70000019				

State- and tribal - equivalent CERCLIS

CA ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the CA ENVIROSTOR list, as provided by EDR, and dated 03/11/2015 has revealed that there are 35 CA ENVIROSTOR sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CAPITOL PLATING CORP	***319 3RD STREET***	***0 - 1/8 (0.000 mi.)***	***G44***	***53***
Facility Id: 57340006				
Status: Backlog				
UNION PACIFIC SACRAM	***501 JIBBOOM ST***	***SE 0 - 1/8 (0.032 mi.)***	***J90***	***133***
Facility Id: 34720169				
Status: Refer: Other Agency				
UP, DOWNTOWN SAC - C	***401 I STREET***	***SE 0 - 1/8 (0.032 mi.)***	***J93***	***218***
Facility Id: 60001378				
Facility Id: 60001447				
Facility Id: 34400008				
Facility Id: 34400009				
Facility Id: 34400010				
**Additional key fields are available in the Map Findings section*				
Status: Active				
Status: No Further Action				
Status: Certified				
Status: Certified O&M - Land Use Restrictions Only				
Status: Certified / Operation & Maintenance				
UP, DOWNTOWN SAC - M	***400 I STREET***	***SE 0 - 1/8 (0.076 mi.)***	***L108***	***344***
Facility Id: 70000034				
Status: Active				
CA STATE RAILROAD MU	***501 JIBBOOM ST***	***NNE 0 - 1/8 (0.082 mi.)***	***M110***	***348***
Facility Id: 80001665				
Status: Certified				
FEDERAL COURTHOUSE -	***5TH AND I STREETS***	***SE 1/8 - 1/4 (0.153 mi.)***	***S154***	***379***
Facility Id: 34750040				
Status: Certified O&M - Land Use Restrictions Only				
OLD PG&E PLANT	***240 JIBBOOM ST***	***N 1/4 - 1/2 (0.261 mi.)***	***AG231***	***446***
Facility Id: 34490056				
Status: Certified / Operation & Maintenance				

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
JIBBOOM JUNKYARD Facility Id: 34490023 Status: Certified	***240-260 JIBBOOM STRE***	***N 1/4 - 1/2 (0.263 mi.)***	***AG232***	***459***
A-B-C CLEANERS Facility Id: 34720001 Status: Refer: Other Agency	1120 7TH STREET	SE 1/4 - 1/2 (0.381 mi.)	AS263	529
TOWER COURT Facility Id: 60000968 Status: Inactive - Action Required	***706 WEST CAPITAL AVE***	***SW 1/4 - 1/2 (0.386 mi.)***	***267***	***535***
SACRAMENTO FOODS, IN Facility Id: 34200018 Status: Refer: Other Agency	***424 NORTH 7TH STREET***	***E 1/4 - 1/2 (0.405 mi.)***	***273***	***545***
WESTCO TECHNOLOGIES Facility Id: 57290002 Status: Refer: RWQCB	801 SOUTH RIVER RD.	SSW 1/4 - 1/2 (0.472 mi.)	AX287	589
UNION PACIFIC BANNON Facility Id: 70000028 Status: Active	***NORTH B STREET AND S***	***ENE 1/2 - 1 (0.518 mi.)***	***296***	***622***
BIGGERS INDUSTRIAL G Facility Id: 34340018 Status: No Further Action	***551 SEQUOIA PACIFIC***	***NE 1/2 - 1 (0.520 mi.)***	***AZ297***	***625***
VAN WATERS AND ROGER Facility Id: 57510003 Status: Refer: RWQCB	***850 SOUTH RIVER ROAD***	***SSW 1/2 - 1 (0.550 mi.)***	***298***	***628***
SACRAMENTO STUCCO CO Facility Id: 60000284 Status: Inactive - Action Required	***860 RISKE LANE***	***SW 1/2 - 1 (0.611 mi.)***	***299***	***631***
SUNSHINE LAUNDRY AND Facility Id: 57720003 Status: Refer: Other Agency	820 MERKLEY AVENUE	WSW 1/2 - 1 (0.651 mi.)	300	635
MATHER STORAGE ANX (Facility Id: 80000054 Status: No Further Action		SSE 1/2 - 1 (0.689 mi.)	302	636
SACRAMENTO ENGINEERI Facility Id: 80000700 Status: Inactive - Needs Evaluation		SSW 1/2 - 1 (0.707 mi.)	BA304	638
PROPOSED K-8 FUNDAME Facility Id: 70000067 Status: Inactive - Needs Evaluation	***NW CORNER OF LIGHTHO***	***WNW 1/2 - 1 (0.724 mi.)***	***306***	***644***
SACRAMENTO HOUSING & Facility Id: 34240036 Status: Certified O&M - Land Use Restrictions Only	***1920 FRONT STREET***	***S 1/2 - 1 (0.727 mi.)***	***BB307***	***646***
MCCURRY COMPANIES Facility Id: 34590018 Status: No Further Action	1231 K ST	SE 1/2 - 1 (0.736 mi.)	308	654
H&H CLEANERS Facility Id: 57720007 Status: Refer: Other Agency	***1231 MERKLEY AVE***	***WSW 1/2 - 1 (0.758 mi.)***	***309***	***655***
RICE GROWERS ASSOCIA Facility Id: 57200005 Status: No Further Action	***901 SOUTH RIVER ROAD***	***SW 1/2 - 1 (0.764 mi.)***	***311***	***657***

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
TOMLIN'S SUNSHINE CL Facility Id: 57720004 Status: Refer: Other Agency	612 MICHIGAN BLVD	WSW 1/2 - 1 (0.808 mi.)	312	659
PG&E - SACRAMENTO SI Facility Id: 34490048 Status: Active	***2000 FRONT STREET***	***S 1/2 - 1 (0.834 mi.)***	***BC313***	***660***
PAYLESS CLEANERS (2) Facility Id: 57720002 Status: Refer: Other Agency	1351 MERKLEY AVENUE	WSW 1/2 - 1 (0.849 mi.)	316	701
CALTRANS, I-5 Q STRE Facility Id: 34240037 Status: Certified O&M - Land Use Restrictions Only	***I-5 Q STREET OFF-RAM***	***S 1/2 - 1 (0.854 mi.)***	***BC317***	***702***
FABRICARE ONE HOUR M Facility Id: 57720005 Status: Refer: Other Agency	827 JEFFERSON BOULEV	WSW 1/2 - 1 (0.876 mi.)	318	709
723 S STREET Facility Id: 34990003 Status: Refer: Other Agency	***723 S STREET***	***SSE 1/2 - 1 (0.878 mi.)***	***319***	***710***
SMUD, FRONT & T STRE Facility Id: 34490057 Status: Certified O&M - Land Use Restrictions Only	***FRONT & T STREETS***	***S 1/2 - 1 (0.895 mi.)***	***BD320***	***712***
SIMS METAL SITE Facility Id: 70000019 Status: Active	***130 NORTH 12 STREET;***	***E 1/2 - 1 (0.927 mi.)***	***321***	***725***
THE DOCKS AREA SACRA Facility Id: 60000357 Status: No Further Action	***CITY OF SACRAMENTO R***	***S 1/2 - 1 (0.935 mi.)***	***BD322***	***731***
SACRAMENTO SIGNAL DE Facility Id: 80000605 Status: No Further Action	NORTH 7TH STREET	NE 1/2 - 1 (0.939 mi.)	323	734
CADA WAREHOUSE REDEV Facility Id: 34390001 Status: Certified	***1108 R STREET***	***SSE 1/2 - 1 (0.971 mi.)***	***324***	***735***

State and tribal leaking storage tank lists

CA LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the State Water Resources Control Board Leaking Underground Storage Tank Information System.

A review of the CA LUST list, as provided by EDR, and dated 03/13/2015 has revealed that there are 54 CA LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
FORMER HUDSON Global Id: T0611300035 Status: Completed - Case Closed Status: Case Closed	***500 C ST***	***0 - 1/8 (0.000 mi.)***	***B11***	***16***

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
YOLO CO PUBLIC WORKS Global Id: T0611300209 Status: Completed - Case Closed	4TH ST & B ST	0 - 1/8 (0.000 mi.)	D20	21
COMMUN. CENTER Global Id: T0606700058 Status: Completed - Case Closed Status: Case Closed	***111 BERCUT DR***	***0 - 1/8 (0.000 mi.)***	***F21***	***22***
YOLO CO PUBLIC WORKS Status: Case Closed	***4TH ST & B ST***	***0 - 1/8 (0.000 mi.)***	***D34***	***33***
GARY'S MOWHAWK SERVI Global Id: T0611338487 Global Id: T0611300087 Status: Completed - Case Closed Status: Case Closed	***427 C STREET***	***0 - 1/8 (0.000 mi.)***	***E63***	***80***
GARY'S MOWHAWK SERVI Status: Preliminary site assessment underway	427 C STREET	0 - 1/8 (0.000 mi.)	E76	95
UP, DOWNTOWN SAC - C Global Id: T0606700084 Status: Completed - Case Closed Status: Case Closed	***401 I STREET***	***SE 0 - 1/8 (0.032 mi.)***	***J93***	***218***
OLD TRAILWAYS PROP Global Id: T0611300065 Status: Completed - Case Closed Status: Case Closed	***500 E ST***	***WSW 0 - 1/8 (0.097 mi.)***	***N113***	***354***
ON THE BALL GRAPHICS Global Id: T0611300154 Status: Completed - Case Closed Status: Case Closed	***500 5TH ST***	***WSW 0 - 1/8 (0.098 mi.)***	***N114***	***356***
PARKING LOT D 510 D Global Id: T0606700528 Status: Completed - Case Closed Status: Case Closed	***428 J ST***	***SSE 1/8 - 1/4 (0.146 mi.)***	***Q147***	***371***
SAFETY GARAGE Global Id: T0606700847 Status: Completed - Case Closed Status: Case Closed	***801 5TH ST***	***SE 1/8 - 1/4 (0.152 mi.)***	***S153***	***377***
TURNER LAND COMPANY Status: Pollution Characterization	800 SACRAMENTO AVENU	W 1/8 - 1/4 (0.191 mi.)	W180	393
TURNER LAND COMPANY Global Id: T0611318234 Status: Completed - Case Closed	8TH AND SACRAMENTO A	W 1/8 - 1/4 (0.191 mi.)	W181	393
FORMER CITY OF SACRA Global Id: T10000000640 Status: Completed - Case Closed	***631 H STREET***	***SE 1/4 - 1/2 (0.254 mi.)***	***AB228***	***426***
OLD PG&E PLANT Global Id: T0606700255 Status: Completed - Case Closed Status: Case Closed	***240 JIBBOOM ST***	***N 1/4 - 1/2 (0.261 mi.)***	***AG231***	***446***
SACRAMENTO COUNTY JA Status: Leak being confirmed	651 I STREET	SE 1/4 - 1/2 (0.265 mi.)	AC233	462

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SACRAMENTO COUNTY JA	***651 I STREET***	***SE 1/4 - 1/2 (0.265 mi.)***	***AC234***	***463***
Global Id: T0606714066				
Status: Open - Site Assessment				
MILNE TRUCKING	***830 E ST***	***W 1/4 - 1/2 (0.270 mi.)***	***235***	***466***
Global Id: T0611300046				
Status: Completed - Case Closed				
Status: Pollution Characterization				
TEXACO SS (FORMER)	***226 JIBBOOM ST***	***N 1/4 - 1/2 (0.305 mi.)***	***AG237***	***477***
Global Id: T0606700537				
Status: Completed - Case Closed				
Status: Case Closed				
SHELL #204-6678-9003	***225 JIBBOOM ST***	***N 1/4 - 1/2 (0.310 mi.)***	***AG238***	***480***
Global Id: T0606700500				
Status: Completed - Case Closed				
Status: Preliminary site assessment underway				
ARCO #6168	***222 JIBBOOM ST***	***N 1/4 - 1/2 (0.315 mi.)***	***AI240***	***486***
Status: Case Closed				
ARCO #6168	***222 JIBBOOM***	***N 1/4 - 1/2 (0.315 mi.)***	***AI241***	***486***
Global Id: T0606700277				
Status: Completed - Case Closed				
DOWNTOWN PARKING GAR	725 7TH ST	ESE 1/4 - 1/2 (0.322 mi.)	AJ242	489
Status: No Action				
DOWNTOWN PARKING GAR	***725 7TH ST***	***ESE 1/4 - 1/2 (0.322 mi.)***	***AJ243***	***489***
Global Id: T0606792021				
Status: Completed - Case Closed				
TEXACO SERVICE STATI	WEST CAPITOL & THIRD	SW 1/4 - 1/2 (0.325 mi.)	AH244	494
Global Id: T0611344694				
Status: Completed - Case Closed				
SCHETTER ELECTRIC	471 BANNON STREET	NE 1/4 - 1/2 (0.330 mi.)	AK245	497
Status: Leak being confirmed				
SCHETTER ELECTRIC	***471 BANNON STREET***	***NE 1/4 - 1/2 (0.330 mi.)***	***AK246***	***498***
Global Id: T0606797784				
Status: Open - Eligible for Closure				
SHERIFF ADM BLDG	***711 G ST***	***ESE 1/4 - 1/2 (0.337 mi.)***	***AJ247***	***500***
Global Id: T0606700159				
Status: Completed - Case Closed				
Status: Case Closed				
MATHESON FAST FREIGH	***455 BANNON ST***	***NE 1/4 - 1/2 (0.339 mi.)***	***AK248***	***502***
Global Id: T0606701060				
Status: Open - Site Assessment				
Status: Leak being confirmed				
RALEY'S LANDING/PARR	490 WEST CAPITOL AVE	SW 1/4 - 1/2 (0.350 mi.)	AM252	508
Global Id: T0611300078				
Status: Completed - Case Closed				
Status: Case Closed				
STERLING TRANSIT	***832 F ST***	***WSW 1/4 - 1/2 (0.350 mi.)***	***AN253***	***509***
Global Id: T0611300077				
Status: Completed - Case Closed				
Status: Case Closed				
CARDLUCK SITE (CASE	***300 RICHARDS BLVD***	***NNE 1/4 - 1/2 (0.353 mi.)***	***AO255***	***512***
Global Id: T0606791997				
Global Id: T0606700294				
Status: Completed - Case Closed				

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PACIFIC MOTOR TRUCKI	***300 RICHARDS BLVD***	***NNE 1/4 - 1/2 (0.353 mi.)***	***AO256***	***516***
Status: Case Closed				
CONWAY WESTERN EXPRE	900 E ST	W 1/4 - 1/2 (0.354 mi.)	AP257	521
Status: Case Closed				
CONWAY WESTERN EXPRE	***900 E ST***	***W 1/4 - 1/2 (0.354 mi.)***	***AP258***	***521***
Global Id: T0611300037				
Status: Completed - Case Closed				
CONTINENTAL CAN CO	***601 7TH ST N***	***ESE 1/4 - 1/2 (0.358 mi.)***	***AQ259***	***523***
Global Id: T0606700098				
Status: Completed - Case Closed				
Status: Case Closed				
MOTOROLA	***301 RICHARDS BLVD***	***NNE 1/4 - 1/2 (0.366 mi.)***	***AO261***	***525***
Global Id: T0606700256				
Status: Completed - Case Closed				
Status: Case Closed				
HOLIDAY INN	***200 JIBBOOM ST***	***N 1/4 - 1/2 (0.374 mi.)***	***AR262***	***528***
Global Id: T0606700725				
Status: Completed - Case Closed				
Status: Case Closed				
FEDERAL BUILDING - G	***801 I ST***	***SE 1/4 - 1/2 (0.382 mi.)***	***AT264***	***530***
Global Id: T0606700989				
Status: Completed - Case Closed				
Status: Case Closed				
WILLIG FREIGHT LINES	***850 F ST***	***WSW 1/4 - 1/2 (0.389 mi.)***	***AN268***	***538***
Status: Case Closed				
WILLIG FREIGHT LINES	***850 F ST***	***WSW 1/4 - 1/2 (0.389 mi.)***	***AN269***	***540***
Global Id: T0611300103				
Status: Completed - Case Closed				
LOT X CITY OF SACRAM	***0 N ST***	***S 1/4 - 1/2 (0.399 mi.)***	***272***	***543***
Global Id: T0606716751				
Status: Open - Site Assessment				
RELLES OIL	804 SOUTH RIVER ROAD	SSW 1/4 - 1/2 (0.407 mi.)	AU274	550
Status: Preliminary site assessment underway				
RELLES OIL	***804 SOUTH RIVER ROAD***	***SSW 1/4 - 1/2 (0.407 mi.)***	***AU275***	***550***
Global Id: T0611355558				
Status: Completed - Case Closed				
GREYHOUND BUS TERMIN	***715 L ST***	***SE 1/4 - 1/2 (0.413 mi.)***	***AS276***	***555***
Global Id: T0606700301				
Status: Open - Eligible for Closure				
Status: Post remedial action monitoring				
FORMER EXPERIENCE MO	820-824 WEST CAPITOL	WSW 1/4 - 1/2 (0.456 mi.)	AV278	567
Global Id: T10000000425				
Status: Completed - Case Closed				
TUNE UP MASTERS	***1400 5TH ST***	***SSE 1/4 - 1/2 (0.459 mi.)***	***279***	***571***
Global Id: T0606700272				
Status: Completed - Case Closed				
Status: Case Closed				
SACRAMENTO CITY HALL	***915 I ST***	***SE 1/4 - 1/2 (0.466 mi.)***	***282***	***581***
Global Id: T0606700575				
Status: Completed - Case Closed				
Status: Case Closed				

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LOUIE BROTHERS GARAG Global Id: T0606700533 Status: Completed - Case Closed Status: Case Closed	805-809 L ST	SE 1/4 - 1/2 (0.467 mi.)	AW283	583
CALVADA SALES COMPAN Global Id: T0606701010 Status: Completed - Case Closed Status: Case Closed	***444 RICHARDS BLVD***	***NE 1/4 - 1/2 (0.481 mi.)***	***290***	***595***
CHEVRON #9-4176 Global Id: T0606700942 Status: Completed - Case Closed Status: Leak being confirmed	***1601 J ST (AKA 925 1***	***SE 1/4 - 1/2 (0.485 mi.)***	***291***	***599***
FREDERICKSEN TANK LI Global Id: T0611300031 Status: Completed - Case Closed	***850 DELTA LN***	***SW 1/4 - 1/2 (0.492 mi.)***	***AY292***	***603***
FREDERICKSEN TANK LI Status: Pollution Characterization	***850 DELTA LN***	***SW 1/4 - 1/2 (0.492 mi.)***	***AY293***	***617***
SLAKEY BROS INC Global Id: T0606700698 Status: Completed - Case Closed Status: Case Closed	***500 SEQUOIA-PACIFIC***	***NE 1/4 - 1/2 (0.493 mi.)***	***AZ295***	***621***

CA SLIC: SLIC Region comes from the California Regional Water Quality Control Board.

A review of the CA SLIC list, as provided by EDR, and dated 03/13/2015 has revealed that there are 8 CA SLIC sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CAPITOL PLATING CORP Global Id: SL0611399897 Facility Status: Open - Inactive	***319 3RD STREET***	***0 - 1/8 (0.000 mi.)***	***G44***	***53***
UNION PACIFIC SACRAM Global Id: SLT5S2473286 Facility Status: Open - Inactive	***501 JIBBOOM ST***	***SE 0 - 1/8 (0.032 mi.)***	***J90***	***133***
UP, DOWNTOWN SAC - C Global Id: T10000005281 Global Id: T10000005278 Global Id: SL205072992 Global Id: T10000001979 Global Id: T10000001965 **Additional key fields are available in the Map Findings section* Facility Status: Completed - Case Closed Facility Status: Open - Verification Monitoring Facility Status: Open - Site Assessment Facility Status: Open - Remediation Facility Status: Open - Assessment & Interim Remedial Action	***401 I STREET***	***SE 0 - 1/8 (0.032 mi.)***	***J93***	***218***
GRAIWER PROPERTY	E, F, 7TH & 8TH STS	WSW 1/8 - 1/4 (0.216 mi.)	Z199	404
OLD PG&E PLANT Global Id: SLT5S1673207 Global Id: SLT5S2133252 Facility Status: Completed - Case Closed Facility Status: Open - Verification Monitoring	***240 JIBBOOM ST***	***N 1/4 - 1/2 (0.261 mi.)***	***AG231***	***446***

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
THE SACRAMENTO UNION	***301 CAPITOL MALL***	***S 1/4 - 1/2 (0.345 mi.)***	***AL249***	***506***
Global Id: SL0606737129				
Facility Status: Open - Inactive				
CAPITOL GATEWAY	301 CAPITOL MALL	S 1/4 - 1/2 (0.345 mi.)	AL250	507
COAST OIL COMPANY**	801 RIVER RD S	SSW 1/4 - 1/2 (0.472 mi.)	AX286	589

CA Sacramento Co. CS: List of sites where unauthorized releases of potentially hazardous materials have occurred.

A review of the CA Sacramento Co. CS list, as provided by EDR, and dated 11/03/2014 has revealed that there are 31 CA Sacramento Co. CS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
COMMUN. CENTER	***111 BERCUT DR***	***0 - 1/8 (0.000 mi.)***	***F21***	***22***
Facility Id: RO0000235				
SOUTHERN PACIFIC RAI	401 I ST	SE 0 - 1/8 (0.032 mi.)	J85	120
Facility Id: RO0001696				
UNION PACIFIC SACRAM	***501 JIBBOOM ST***	***SE 0 - 1/8 (0.032 mi.)***	***J90***	***133***
Date Closed: 07/21/1997				
Facility Id: RO0001105				
UP, DOWNTOWN SAC - C	***401 I STREET***	***SE 0 - 1/8 (0.032 mi.)***	***J93***	***218***
Facility Id: RO0000635				
SUSD	425 I ST	SE 0 - 1/8 (0.056 mi.)	J105	343
Facility Id: RO0000636				
SAFETY GARAGE	***801 5TH ST***	***SE 1/8 - 1/4 (0.152 mi.)***	***S153***	***377***
Date Closed: 12/05/1996				
Facility Id: RO0000100				
SHRA LOT D	510 DOWNTOWN PLAZA	SSE 1/8 - 1/4 (0.250 mi.)	AF227	426
Date Closed: 02/24/1993				
Facility Id: RO0000337				
FORMER CITY OF SACRA	***631 H STREET***	***SE 1/4 - 1/2 (0.254 mi.)***	***AB228***	***426***
Date Closed: 12/23/2008				
Facility Id: RO0001657				
OLD PG&E PLANT	***240 JIBBOOM ST***	***N 1/4 - 1/2 (0.261 mi.)***	***AG231***	***446***
Date Closed: 04/13/1999				
Facility Id: RO0000674				
SACRAMENTO COUNTY JA	***651 I STREET***	***SE 1/4 - 1/2 (0.265 mi.)***	***AC234***	***463***
Facility Id: RO0001634				
TEXACO SS (FORMER)	***226 JIBBOOM ST***	***N 1/4 - 1/2 (0.305 mi.)***	***AG237***	***477***
Date Closed: 03/17/1997				
Facility Id: RO0000673				
SHELL #204-6678-9003	***225 JIBBOOM ST***	***N 1/4 - 1/2 (0.310 mi.)***	***AG238***	***480***
Facility Id: RO0000672				
ARCO #6168	***222 JIBBOOM***	***N 1/4 - 1/2 (0.315 mi.)***	***AI241***	***486***
Facility Id: RO0000671				
DOWNTOWN PARKING GAR	***725 7TH ST***	***ESE 1/4 - 1/2 (0.322 mi.)***	***AJ243***	***489***
Facility Id: RO0001371				
SCHETTER ELECTRIC	***471 BANNON STREET***	***NE 1/4 - 1/2 (0.330 mi.)***	***AK246***	***498***
Facility Id: RO0001577				

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SHERIFF ADM BLDG Facility Id: RO0000577	***711 G ST***	***ESE 1/4 - 1/2 (0.337 mi.)***	***AJ247***	***500***
MATHESON FAST FREIGH Facility Id: RO0001268	***455 BANNON ST***	***NE 1/4 - 1/2 (0.339 mi.)***	***AK248***	***502***
CARDLUCK SITE (CASE Date Closed: 09/25/1998 Facility Id: RO0001002 Facility Id: RO0001003	***300 RICHARDS BLVD***	***NNE 1/4 - 1/2 (0.353 mi.)***	***AO255***	***512***
COUNTY OF SACRAMENTO Facility Id: RO0000123	***575 7TH ST***	***ESE 1/4 - 1/2 (0.363 mi.)***	***AQ260***	***524***
MOTOROLA Facility Id: RO0001004	***301 RICHARDS BLVD***	***NNE 1/4 - 1/2 (0.366 mi.)***	***AO261***	***525***
FEDERAL BUILDING - G Date Closed: 06/05/1998 Facility Id: RO0000637	***801 I ST***	***SE 1/4 - 1/2 (0.382 mi.)***	***AT264***	***530***
SACTO HOUSING & Facility Id: RO0000126	***917 8TH ST***	***SE 1/4 - 1/2 (0.382 mi.)***	***AT265***	***533***
WELLS FARGO BANK Date Closed: 05/16/2001 Facility Id: RO0001431	500 CAPITOL MALL	SSE 1/4 - 1/2 (0.390 mi.)	270	542
LOT X CITY OF SACRAM Facility Id: RO0001632	***0 N ST***	***S 1/4 - 1/2 (0.399 mi.)***	***272***	***543***
GREYHOUND BUS TERMIN Facility Id: RO0000694	***715 L ST***	***SE 1/4 - 1/2 (0.413 mi.)***	***AS276***	***555***
TUNE UP MASTERS Date Closed: 04/22/1996 Facility Id: RO0000101	***1400 5TH ST***	***SSE 1/4 - 1/2 (0.459 mi.)***	***279***	***571***
SACRAMENTO CITY HALL Date Closed: 01/24/1997 Facility Id: RO0000638	***915 I ST***	***SE 1/4 - 1/2 (0.466 mi.)***	***282***	***581***
JAMES LOUIE Date Closed: 04/25/2003 Facility Id: RO0000695	***805 L ST***	***SE 1/4 - 1/2 (0.468 mi.)***	***AW284***	***585***
CALVADA SALES COMPAN Facility Id: RO0001005	***444 RICHARDS BLVD***	***NE 1/4 - 1/2 (0.481 mi.)***	***290***	***595***
CHEVRON #9-4176 Facility Id: RO0000644	***1601 J ST (AKA 925 1***	***SE 1/4 - 1/2 (0.485 mi.)***	***291***	***599***
SALKEY BROTHERS, INC Date Closed: 12/05/1994 Facility Id: RO0001056	***500 SEQUOIA PACIFIC***	***NE 1/4 - 1/2 (0.493 mi.)***	***AZ294***	***618***

State and tribal registered storage tank lists

CA UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the CA UST list, as provided by EDR, and dated 03/13/2015 has revealed that there are 16 CA UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
W SAC LIGHTHOUSE PUM Facility Id: FA0000569 Current Status: 02	310 B ST	0 - 1/8 (0.000 mi.)	A6	13
YOLO CO PUBLIC WORKS Facility Id: FA0000442 Current Status: 02	213 4TH ST	0 - 1/8 (0.000 mi.)	D8	14
GOLDEN EAGLE GARAGE Facility Id: FA0000467 Current Status: 02	519 C ST	0 - 1/8 (0.000 mi.)	B10	15
ON THE BALL GRAPHICS Facility Id: FA0000250 Current Status: 02	500 C ST	0 - 1/8 (0.000 mi.)	B19	20
SACRAMENTO COMMUNICA Facility Id: FA0008534	111 BERCUT DR	0 - 1/8 (0.000 mi.)	F28	30
CAPITOL PLATING - W Facility Id: FA0000081 Current Status: 02	319 3RD ST	0 - 1/8 (0.000 mi.)	G40	49
GARY'S SERVICE Facility Id: FA0000178 Current Status: 02	427 C ST	0 - 1/8 (0.000 mi.)	E61	79
LEHRER VACANT LOT Facility Id: FA0000586 Current Status: 02	317-319 C ST	0 - 1/8 (0.000 mi.)	C70	91
STORM DRAINAGE PUMP Facility Id: FA0003513 Current Status: 02	326 5TH STREET	0 - 1/8 (0.000 mi.)	B72	93
NINA'S DELI Facility Id: FA0000578 Current Status: 02	316 6TH ST	W 0 - 1/8 (0.044 mi.)	K101	342
RALEY'S LANDING Facility Id: FA0000474 Current Status: 02	500 E ST	WSW 0 - 1/8 (0.097 mi.)	N112	353
W SAC PUBLIC WORKS Facility Id: FA0000570 Current Status: 02	201 F ST	SSW 1/8 - 1/4 (0.139 mi.)	R138	368
RIVERVIEW PLAZA Facility Id: FA0010655	***600 I ST***	***SE 1/8 - 1/4 (0.229 mi.)***	***AC203***	***408***
VACANT PROPERTY Facility Id: FA0002470 Current Status: 02	710-712 3RD ST	SW 1/8 - 1/4 (0.230 mi.)	AA205	410
LINDEMAN BROTHERS Facility Id: FA0000233 Current Status: 02	800 E ST	WSW 1/8 - 1/4 (0.235 mi.)	Z212	415

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SAN JOAQUIN MOTOR TR Facility Id: FA0000339 Current Status: 02	805 E ST	WSW 1/8 - 1/4 (0.240 mi.)	Z218	418

State and tribal voluntary cleanup sites

CA VCP: Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

A review of the CA VCP list, as provided by EDR, and dated 03/11/2015 has revealed that there are 4 CA VCP sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
UP, DOWNTOWN SAC - C Status: Active Facility Id: 34400011 Facility Id: 60001652	***401 I STREET***	***SE 0 - 1/8 (0.032 mi.)***	***J93***	***218***
FEDERAL COURTHOUSE - Status: Certified O&M - Land Use Restrictions Only Facility Id: 34750040	***5TH AND I STREETS***	***SE 1/8 - 1/4 (0.153 mi.)***	***S154***	***379***
OLD PG&E PLANT Status: Certified / Operation & Maintenance Facility Id: 34490056	***240 JIBBOOM ST***	***N 1/4 - 1/2 (0.261 mi.)***	***AG231***	***446***
TOWER COURT Status: Inactive - Action Required Facility Id: 60000968	***706 WEST CAPITAL AVE***	***SW 1/4 - 1/2 (0.386 mi.)***	***267***	***535***

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: The EPA's listing of Brownfields properties from the Cleanups in My Community program, which provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

A review of the US BROWNFIELDS list, as provided by EDR, and dated 12/22/2014 has revealed that there are 13 US BROWNFIELDS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
205 2ND STREET	***205 2ND STREET***	***0 - 1/8 (0.000 mi.)***	***1***	***8***
319 3RD STREET	***319 3RD STREET***	***0 - 1/8 (0.000 mi.)***	***G41***	***49***
WASHINGTON FIREHOUSE	***317 3RD STREET***	***0 - 1/8 (0.000 mi.)***	***G45***	***57***
FIREHOUSE BLOCK SITE	***325 3RD STREET***	***0 - 1/8 (0.000 mi.)***	***G47***	***65***
CAPITOL PLATING	319 3RD STREET	0 - 1/8 (0.000 mi.)	G56	73
FIREHOUSE BLOCK SITE	***320 2ND STREET***	***0 - 1/8 (0.000 mi.)***	***G58***	***76***
RIVER ONE PROPERTY	***765 3RD STREET***	***SSW 1/4 - 1/2 (0.285 mi.)***	***AH236***	***475***

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
820 WEST CAPITOL AVE	***820 WEST CAPITOL AVE***	***WSW 1/4 - 1/2 (0.456 mi.)***	***AV277***	***565***
THE EXPERIENCE MOTEL	***824 WEST CAPITOL AVE***	***WSW 1/4 - 1/2 (0.459 mi.)***	***AV280***	***574***
OLD TOWN INN	***826 WEST CAPITOL AVE***	***WSW 1/4 - 1/2 (0.460 mi.)***	***AV281***	***579***
WHALEY PROPERTY	***804 SOUTH RIVER ROAD***	***SSW 1/4 - 1/2 (0.470 mi.)***	***AX285***	***586***
RIVER WALK PROPERTY	***SOUTH RIVER ROAD & T***	***SSW 1/4 - 1/2 (0.473 mi.)***	***AX288***	***590***
CAPITOL TRAVEL INN	***817 WEST CAPITOL AVE***	***WSW 1/4 - 1/2 (0.477 mi.)***	***AV289***	***593***

Local Lists of Landfill / Solid Waste Disposal Sites

CA SWRCY: A listing of recycling facilities in California.

A review of the CA SWRCY list, as provided by EDR, and dated 03/16/2015 has revealed that there is 1 CA SWRCY site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CABRERAS RECYCLING Cert Id: RC14901	737 SACRAMENTO AVE	W 1/4 - 1/2 (0.391 mi.)	271	543

CA WMUDS/SWAT: The Waste Management Unit Database System is used for program tracking and inventory of waste management units. The source is the State Water Resources Control Board.

A review of the CA WMUDS/SWAT list, as provided by EDR, and dated 04/01/2000 has revealed that there is 1 CA WMUDS/SWAT site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
UP, DOWNTOWN SAC - C	***401 I STREET***	***SE 0 - 1/8 (0.032 mi.)***	***J93***	***218***

Local Lists of Hazardous waste / Contaminated Sites

CA HIST Cal-Sites: Formerly known as ASPIS, this database contains both known and potential hazardous substance sites. The source is the California Department of Toxic Substance Control. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

A review of the CA HIST Cal-Sites list, as provided by EDR, and dated 08/08/2005 has revealed that there are 9 CA HIST Cal-Sites sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
UP, DOWNTOWN SAC - L	401 I STREET	SE 0 - 1/8 (0.032 mi.)	J82	98
SP, SAC - SAND PILES	401 I STREET	SE 0 - 1/8 (0.032 mi.)	J86	120
SP, SAC - BATTERY SH	401 I STREET	SE 0 - 1/8 (0.032 mi.)	J88	127
UP, DOWNTOWN SAC - N	***401 I STREET***	***SE 0 - 1/8 (0.032 mi.)***	***J91***	***150***
SP, SAC - SACRAMENTO	401 I STREET	SE 0 - 1/8 (0.032 mi.)	J92	211
JIBBOOM JUNKYARD	***240-260 JIBBOOM STRE***	***N 1/4 - 1/2 (0.263 mi.)***	***AG232***	***459***
SACRAMENTO HOUSING &	1920 FRONT STREET	S 1/2 - 1 (0.723 mi.)	BB305	639
PG&E - SACRAMENTO SI	2000 FRONT STREET	S 1/2 - 1 (0.834 mi.)	BC314	689
SMUD, FRONT & T STRE	***FRONT & T STREETS***	***S 1/2 - 1 (0.895 mi.)***	***BD320***	***712***

EXECUTIVE SUMMARY

Local Lists of Registered Storage Tanks

CA FID UST: The Facility Inventory Database contains active and inactive underground storage tank locations. The source is the State Water Resource Control Board.

A review of the CA FID UST list, as provided by EDR, and dated 10/31/1994 has revealed that there are 4 CA FID UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
COMMUNICATION CENTER Facility Id: 34006512 Status: A	***111 BERCUT DR***	***0 - 1/8 (0.000 mi.)***	***F27***	***30***
SP SACRAMENTO RAIL Y Facility Id: 34000185 Status: A	***401 I ST***	***SE 0 - 1/8 (0.032 mi.)***	***J83***	***113***
PACIFIC TRAILWAYS Facility Id: 34007318 Status: A	***520 E ST***	***WSW 0 - 1/8 (0.101 mi.)***	***N115***	***358***
OLD SACRAMENTO JAIL Facility Id: 34001249 Status: I	***620 H ST***	***SE 1/8 - 1/4 (0.246 mi.)***	***AB223***	***423***

CA HIST UST: Historical UST Registered Database.

A review of the CA HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 14 CA HIST UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
HUDSON (#138) Facility Id: 00000060109	500 C ST	0 - 1/8 (0.000 mi.)	B12	17
SACRAMENTO RIVER WAT Facility Id: 00000018385	101 BERCUT DR	0 - 1/8 (0.000 mi.)	F24	29
COMMUNICATION CENTER Facility Id: 00000018380	111 BERCUT DR	0 - 1/8 (0.000 mi.)	F29	31
BRODERICK CORPORATIO Facility Id: 00000011456	FOURTH STREET AT "B"	0 - 1/8 (0.000 mi.)	35	34
CAPITOL PLATING CORP Facility Id: 00000013691	***319 3RD STREET***	***0 - 1/8 (0.000 mi.)***	***G44***	***53***
ELMER'S SERVICE STAT Facility Id: 00000051899	427 C ST	0 - 1/8 (0.000 mi.)	E64	88
ELMER'S SERVICE Facility Id: 00000015867	427 C ST	0 - 1/8 (0.000 mi.)	E66	89
SACRAMENTO (P&M) Facility Id: 00000063980	401 I ST	SE 0 - 1/8 (0.032 mi.)	J84	119
SACRAMENTO LOCOMOTIV Facility Id: 00000054635	401 I ST	SE 0 - 1/8 (0.032 mi.)	J87	123
PACIFIC TRAILWAYS Facility Id: 00000068596	520 E STREET	WSW 0 - 1/8 (0.101 mi.)	N116	358
CITY OF SACRAMENTO P Facility Id: 00000038346	801 5TH ST	SE 1/8 - 1/4 (0.152 mi.)	S152	375

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LINDEMAN BROS., INC. Facility Id: 00000013026	800 E ST	WSW 1/8 - 1/4 (0.235 mi.)	Z211	414
PETERS TRUCK LINES# Facility Id: 00000038582	***805 E ST***	***WSW 1/8 - 1/4 (0.240 mi.)***	***Z219***	***419***
COUNTY MAIN JAIL Facility Id: 00000014219	620 "H" STREET	SE 1/8 - 1/4 (0.247 mi.)	AB224	425

CA SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the CA SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there are 5 CA SWEEPS UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
COMMUNICATION CENTER Comp Number: 18380 Status: A Tank Status: A	***111 BERCUT DR***	***0 - 1/8 (0.000 mi.)***	***F27***	***30***
SP SACRAMENTO RAIL Y Comp Number: 54635 Status: A Tank Status: A	***401 I ST***	***SE 0 - 1/8 (0.032 mi.)***	***J83***	***113***
PACIFIC TRAILWAYS Comp Number: 68596 Status: A Tank Status: A	***520 E ST***	***WSW 0 - 1/8 (0.101 mi.)***	***N115***	***358***
SOUTHSIDE VENDING Comp Number: 3900 Status: A Tank Status: A	848 5TH ST	SE 1/8 - 1/4 (0.149 mi.)	S151	374
OLD SACRAMENTO JAIL Comp Number: 14219	***620 H ST***	***SE 1/8 - 1/4 (0.246 mi.)***	***AB223***	***423***

Local Land Records

CA DEED: The use of recorded land use restrictions is one of the methods the DTSC uses to protect the public from unsafe exposures to hazardous substances and wastes .

A review of the CA DEED list, as provided by EDR, and dated 03/09/2015 has revealed that there are 3 CA DEED sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
UP, DOWNTOWN SAC - C Status: OPEN - REMEDIATION Status: OPEN - VERIFICATION MONITORING Status: OPEN - SITE ASSESSMENT Status: ACTIVE Status: CERTIFIED / OPERATION & MAINTENANCE **Additional key fields are available in the Map Findings section* Envirostor ID: T10000001979 Envirostor ID: T10000001959 Envirostor ID: SL205072992 Envirostor ID: 34400009 Envirostor ID: 34400008 **Additional key fields are available in the Map Findings section*	***401 I STREET***	***SE 0 - 1/8 (0.032 mi.)***	***J93***	***218***

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
FEDERAL COURTHOUSE -	***5TH AND I STREETS***	***SE 1/8 - 1/4 (0.153 mi.)***	***S154***	***379***
Status: CERTIFIED O&M - LAND USE RESTRICTIONS ONLY Envirostor ID: 34750040				
OLD PG&E PLANT	***240 JIBBOOM ST***	***N 1/4 - 1/2 (0.261 mi.)***	***AG231***	***446***
Status: CERTIFIED / OPERATION & MAINTENANCE Envirostor ID: 34490056				

Records of Emergency Release Reports

CA CHMIRS: The California Hazardous Material Incident Report System contains information on reported hazardous material incidents, i.e., accidental releases or spills. The source is the California Office of Emergency Services.

A review of the CA CHMIRS list, as provided by EDR, and dated 01/21/2015 has revealed that there are 6 CA CHMIRS sites within approximately 0.001 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported OES Incident Number: 01-6006	3RD ST BETWEEN A & B	0 - 1/8 (0.000 mi.)	A5	11
CITY OF SACRAMENTO OES Incident Number: 02-3345	***101 BERCUT DR***	***0 - 1/8 (0.000 mi.)***	***F23***	***26***
Not reported Date Completed: 19-OCT-90 OES Incident Number: 9013544	422 B STREET #2	0 - 1/8 (0.000 mi.)	D38	47
Not reported OES Incident Number: 06-4318	2 ND & D STREET	0 - 1/8 (0.000 mi.)	H50	69
Not reported OES Incident Number: 02-4206	3RD AND D STREET	0 - 1/8 (0.000 mi.)	G54	72
Not reported OES Incident Number: 06-0820	3RD & C ST.	0 - 1/8 (0.000 mi.)	C73	93

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 12/09/2014 has revealed that there are 2 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PACIFIC BELL	***570 J ST***	***SE 1/8 - 1/4 (0.231 mi.)***	***208***	***412***
PETERS TRUCK LINES#	***805 E ST***	***WSW 1/8 - 1/4 (0.240 mi.)***	***Z219***	***419***

FUDS: The Listing includes locations of Formerly Used Defense Sites Properties where the US Army Corps Of Engineers is actively working or will take necessary cleanup actions.

A review of the FUDS list, as provided by EDR, and dated 06/06/2014 has revealed that there is 1 FUDS site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SACRAMENTO ENGINEERI		SSW 1/2 - 1 (0.706 mi.)	BA303	637

CONSENT: Major Legal settlements that establish responsibility and standards for cleanup at NPL (superfund) sites. Released periodically by U.S. District Courts after settlement by parties to litigation matters.

A review of the CONSENT list, as provided by EDR, and dated 01/23/2015 has revealed that there is 1 CONSENT site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
JIBBOOM JUNKYARD SUP	***240 JIBBOOM ST***	***N 1/4 - 1/2 (0.261 mi.)***	***AG229***	***429***

ROD: Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid the cleanup.

A review of the ROD list, as provided by EDR, and dated 11/25/2013 has revealed that there is 1 ROD site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
JIBBOOM JUNKYARD	***240 - 260 JIBBOOM ST***	***N 1/4 - 1/2 (0.261 mi.)***	***AG230***	***430***

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 01/18/2015 has revealed that there are 9 FINDS sites within approximately 0.001 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
205 2ND STREET	***205 2ND STREET***	***0 - 1/8 (0.000 mi.)***	***1***	***8***
MONITORING STATION	3RD & B ST	0 - 1/8 (0.000 mi.)	A2	10
SACRAMENTO FILTRATIO	***101 BERCUT***	***0 - 1/8 (0.000 mi.)***	***F37***	***46***
319 3RD STREET	***319 3RD STREET***	***0 - 1/8 (0.000 mi.)***	***G41***	***49***
WASHINGTON FIREHOUSE	***317 3RD STREET***	***0 - 1/8 (0.000 mi.)***	***G45***	***57***
FIREHOUSE BLOCK SITE	***325 3RD STREET***	***0 - 1/8 (0.000 mi.)***	***G47***	***65***
STOCKTON PLAT. INC D	***319 3RD ST***	***0 - 1/8 (0.000 mi.)***	***G49***	***68***
FIREHOUSE BLOCK SITE	***320 2ND STREET***	***0 - 1/8 (0.000 mi.)***	***G58***	***76***
GARY'S MOHAWK STATIO	427 C STREET	0 - 1/8 (0.000 mi.)	E65	89

EXECUTIVE SUMMARY

RMP: When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

A review of the RMP list, as provided by EDR, and dated 02/01/2015 has revealed that there is 1 RMP site within approximately 0.001 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SACRAMENTO RIVER WAT	101 BERCUTT DR.	0 - 1/8 (0.000 mi.)	F36	35

CA BOND EXP. PLAN: Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

A review of the CA BOND EXP. PLAN list, as provided by EDR, and dated 01/01/1989 has revealed that there are 5 CA BOND EXP. PLAN sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SP, SAC. - BATTERY S	401 "I" STREET	SE 0 - 1/8 (0.037 mi.)	J96	339
SP, SAC.-LOCOMOTIVE	401 "I" STREET	SE 0 - 1/8 (0.037 mi.)	J97	340
SP, SAC. - PONDS & D	401 "I" STREET	SE 0 - 1/8 (0.037 mi.)	J98	340
JIBBOOM JUNKYARD	I-5 AND JIBBOOM STRE	N 1/8 - 1/4 (0.167 mi.)	168	388
PG&E - SACRAMENTO SI	***2000 FRONT STREET***	***S 1/2 - 1 (0.834 mi.)***	***BC313***	***660***

CA Cortese: The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

A review of the CA Cortese list, as provided by EDR, and dated 03/10/2015 has revealed that there are 3 CA Cortese sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CAPITOL PLATING CORP	***319 3RD STREET***	***0 - 1/8 (0.000 mi.)***	***G44***	***53***
Envirostor Id: 57340006				
Cleanup Status: BACKLOG				
UP, DOWNTOWN SAC - C	***401 I STREET***	***SE 0 - 1/8 (0.032 mi.)***	***J93***	***218***
Envirostor Id: 34400009				
Envirostor Id: 34400010				
Envirostor Id: 34400004				
Envirostor Id: 34400008				
Envirostor Id: 34400007				
**Additional key fields are available in the Map Findings section*				
Cleanup Status: ACTIVE - LAND USE RESTRICTIONS				
Cleanup Status: ACTIVE				
Cleanup Status: CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS				
UP, DOWNTOWN SAC - M	***400 I STREET***	***SE 0 - 1/8 (0.076 mi.)***	***L108***	***344***
Envirostor Id: 70000034				
Cleanup Status: ACTIVE				

EXECUTIVE SUMMARY

CA HIST CORTESE: The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

A review of the CA HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there are 32 CA HIST CORTESE sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
FORMER HUDSON Reg Id: 570056	***500 C ST***	***0 - 1/8 (0.000 mi.)***	***B11***	***16***
COMMUN. CENTER Reg Id: 340081	***111 BERCUT DR***	***0 - 1/8 (0.000 mi.)***	***F21***	***22***
YOLO CO PUBLIC WORKS Reg Id: 570262	***4TH ST & B ST***	***0 - 1/8 (0.000 mi.)***	***D34***	***33***
GARY'S MOWHAWK SERVI Reg Id: 570118	***427 C STREET***	***0 - 1/8 (0.000 mi.)***	***E63***	***80***
UP, DOWNTOWN SAC - C Reg Id: 340118 Reg Id: 34400004 Reg Id: 34400005 Reg Id: 34400006 Reg Id: 34400007 **Additional key fields are available in the Map Findings section*	***401 I STREET***	***SE 0 - 1/8 (0.032 mi.)***	***J93***	***218***
OLD TRAILWAYS PROP Reg Id: 570093	***500 E ST***	***WSW 0 - 1/8 (0.097 mi.)***	***N113***	***354***
ON THE BALL GRAPHICS Reg Id: 570199	***500 5TH ST***	***WSW 0 - 1/8 (0.098 mi.)***	***N114***	***356***
SAFETY GARAGE Reg Id: 341019	***801 5TH ST***	***SE 1/8 - 1/4 (0.152 mi.)***	***S153***	***377***
FEDERAL COURTHOUSE - Reg Id: 34750040	5TH AND I ST	SE 1/8 - 1/4 (0.153 mi.)	S155	384
OLD PG&E PLANT Reg Id: 340322	***240 JIBBOOM ST***	***N 1/4 - 1/2 (0.261 mi.)***	***AG231***	***446***
MILNE TRUCKING Reg Id: 570071	***830 E ST***	***W 1/4 - 1/2 (0.270 mi.)***	***235***	***466***
TEXACO SS (FORMER) Reg Id: 340632	***226 JIBBOOM ST***	***N 1/4 - 1/2 (0.305 mi.)***	***AG237***	***477***
SHELL #204-6678-9003 Reg Id: 340586	***225 JIBBOOM ST***	***N 1/4 - 1/2 (0.310 mi.)***	***AG238***	***480***
ARCO #6168 Reg Id: 340345	***222 JIBBOOM***	***N 1/4 - 1/2 (0.315 mi.)***	***AI241***	***486***
SHERIFF ADM BLDG Reg Id: 340212	***711 G ST***	***ESE 1/4 - 1/2 (0.337 mi.)***	***AJ247***	***500***
MATHESON FAST FREIGH Reg Id: 341236	***455 BANNON ST***	***NE 1/4 - 1/2 (0.339 mi.)***	***AK248***	***502***
BECHER, ROBERT W. & Reg Id: 6A189011N34 Reg Id: 6A189011N35 Reg Id: 6A189011N36	930 CASSELMAN	W 1/4 - 1/2 (0.348 mi.)	251	507
STERLING TRANSIT Reg Id: 570107	***832 F ST***	***WSW 1/4 - 1/2 (0.350 mi.)***	***AN253***	***509***

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RALEY'S LANDING/PARR Reg Id: 570108	490 CAPITOL	SW 1/4 - 1/2 (0.350 mi.)	AM254	512
CARDLUCK SITE (CASE Reg Id: 340363	***300 RICHARDS BLVD***	***NNE 1/4 - 1/2 (0.353 mi.)***	***AO255***	***512***
CONWAY WESTERN EXPRE Reg Id: 570058	***900 E ST***	***W 1/4 - 1/2 (0.354 mi.)***	***AP258***	***521***
CONTINENTAL CAN CO Reg Id: 340138	***601 7TH ST N***	***ESE 1/4 - 1/2 (0.358 mi.)***	***AQ259***	***523***
MOTOROLA Reg Id: 340323	***301 RICHARDS BLVD***	***NNE 1/4 - 1/2 (0.366 mi.)***	***AO261***	***525***
HOLIDAY INN Reg Id: 340878	***200 JIBBOOM ST***	***N 1/4 - 1/2 (0.374 mi.)***	***AR262***	***528***
FEDERAL BUILDING - G Reg Id: 341164	***801 I ST***	***SE 1/4 - 1/2 (0.382 mi.)***	***AT264***	***530***
WILLIG FREIGHT LINES Reg Id: 570137	***850 F ST***	***WSW 1/4 - 1/2 (0.389 mi.)***	***AN269***	***540***
GREYHOUND BUS TERMIN Reg Id: 340370	***715 L ST***	***SE 1/4 - 1/2 (0.413 mi.)***	***AS276***	***555***
TUNE UP MASTERS Reg Id: 340340	***1400 5TH ST***	***SSE 1/4 - 1/2 (0.459 mi.)***	***279***	***571***
SACRAMENTO CITY HALL Reg Id: 340674	***915 I ST***	***SE 1/4 - 1/2 (0.466 mi.)***	***282***	***581***
CHEVRON #9-4176 Reg Id: 341117	***1601 J ST (AKA 925 1***	***SE 1/4 - 1/2 (0.485 mi.)***	***291***	***599***
FREDERICKSEN TANK LI Reg Id: 570046	***850 DELTA LN***	***SW 1/4 - 1/2 (0.492 mi.)***	***AY292***	***603***
SLAKEY BROS INC Reg Id: 340846	***500 SEQUOIA-PACIFIC***	***NE 1/4 - 1/2 (0.493 mi.)***	***AZ295***	***621***

NY MANIFEST: Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

A review of the NY MANIFEST list, as provided by EDR, has revealed that there is 1 NY MANIFEST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
UNION PACIFIC SACRAM	***501 JIBBOOM ST***	***SE 0 - 1/8 (0.032 mi.)***	***J90***	***133***

CA Notify 65: Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

A review of the CA Notify 65 list, as provided by EDR, and dated 10/21/1993 has revealed that there are 2 CA Notify 65 sites within approximately 1 mile of the target property.

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ARCO SERVICE STATION	222 JIBBOOM STREET	N 1/4 - 1/2 (0.315 mi.)	AI239	485
BURNETT & SONS	11TH & C STREETS	E 1/2 - 1 (0.676 mi.)	301	636

CA Sacramento Co. ML: Sacramento County Master List. Any business that has hazardous materials on site - hazardous materials storage sites, underground storage tanks, waste generators.

A review of the CA Sacramento Co. ML list, as provided by EDR, and dated 11/03/2014 has revealed that there are 31 CA Sacramento Co. ML sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
COMMUN. CENTER	***111 BERCUT DR***	***0 - 1/8 (0.000 mi.)***	***F21***	***22***
Facility Status: Inactive. Included on a listing no longer updated.				
CITY OF SACRAMENTO	***101 BERCUT DR***	***0 - 1/8 (0.000 mi.)***	***F23***	***26***
Facility Status: Inactive. Included on a listing no longer updated. Facility Id: U0012886				
UP, DOWNTOWN SAC - C	***401 I STREET***	***SE 0 - 1/8 (0.032 mi.)***	***J93***	***218***
Facility Status: Inactive. Included on a listing no longer updated. Facility Id: U0027386				
CA STATE RAILROAD MU	111 I ST	SSE 0 - 1/8 (0.034 mi.)	I94	338
CA STATE RAILROAD MU	***501 JIBBOOM ST***	***NNE 0 - 1/8 (0.082 mi.)***	***M110***	***348***
FLASH 1 HR PHOTO	127 J ST	SSE 0 - 1/8 (0.113 mi.)	P122	360
DELTA KING	1000 FRONT ST	S 0 - 1/8 (0.120 mi.)	127	364
Facility Status: Inactive. Included on a listing no longer updated.				
EMPTY LOT	4TH/J ST	SSE 1/8 - 1/4 (0.131 mi.)	Q132	366
Facility Status: Inactive. Included on a listing no longer updated.				
D & A PROPERTIES	429 J ST	SSE 1/8 - 1/4 (0.145 mi.)	Q142	369
Facility Status: Inactive. Included on a listing no longer updated.				
C.O.P.Y.	1012 4TH ST	SSE 1/8 - 1/4 (0.145 mi.)	Q143	370
Facility Status: Inactive. Included on a listing no longer updated.				
PARKING LOT D 510 D	***428 J ST***	***SSE 1/8 - 1/4 (0.146 mi.)***	***Q147***	***371***
SACRAMENTO PRINTERY	428 J ST # 110	SSE 1/8 - 1/4 (0.146 mi.)	Q149	373
Facility Status: Inactive. Included on a listing no longer updated.				
SAFETY GARAGE	***801 5TH ST***	***SE 1/8 - 1/4 (0.152 mi.)***	***S153***	***377***
Facility Status: Inactive. Included on a listing no longer updated. Facility Id: U0013486				
ROBERT T. MATSUI US	501 I ST	SE 1/8 - 1/4 (0.155 mi.)	S157	385
O'GRADY'S OLD TIME P	1026 2ND ST	SSE 1/8 - 1/4 (0.161 mi.)	P165	387
HOLIDAY INN CAPITOL	300 J ST	SSE 1/8 - 1/4 (0.165 mi.)	T167	388
ALPHA GRAPHICS PRINT	530 I ST	SE 1/8 - 1/4 (0.177 mi.)	S173	390
Facility Status: Inactive. Included on a listing no longer updated.				
ALPHA GRAPHICS	501 J ST 100	SE 1/8 - 1/4 (0.185 mi.)	U174	390
SUTTER PRINTING	***501 J ST***	***SE 1/8 - 1/4 (0.185 mi.)***	***U175***	***391***
MCGEE'S OLD TIME PHO	1107 FRONT ST	S 1/8 - 1/4 (0.203 mi.)	V191	400
GOLDEN DRAGON RESTAU	1115 FRONT ST	S 1/8 - 1/4 (0.209 mi.)	X192	400
Facility Status: Inactive. Included on a listing no longer updated.				
DAY'S OF 49	1115 FRONT ST #11	S 1/8 - 1/4 (0.209 mi.)	X193	401
Facility Status: Inactive. Included on a listing no longer updated.				
MACY'S	414 K ST	SSE 1/8 - 1/4 (0.213 mi.)	Y195	402
Facility Status: Inactive. Included on a listing no longer updated.				

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
STATE OF CA DEPT OF	560 J ST 170-B	SE 1/8 - 1/4 (0.224 mi.)	U200	404
CITY OF SACTO-HALL O	816 6TH ST	SE 1/8 - 1/4 (0.227 mi.)	AB202	408
Facility Status: Inactive. Included on a listing no longer updated.				
Facility Id: U0015486				
RIVERVIEW PLAZA	***600 I ST***	***SE 1/8 - 1/4 (0.229 mi.)***	***AC203***	***408***
SMUD STATION A SUBST	6TH/H ST	SE 1/8 - 1/4 (0.230 mi.)	AB207	411
PACIFIC BELL	***570 J ST***	***SE 1/8 - 1/4 (0.231 mi.)***	***208***	***412***
Facility Status: Inactive. Included on a listing no longer updated.				
SUPER 8 EXECUTIVE SU	216 BANNON ST	NNE 1/8 - 1/4 (0.241 mi.)	AE220	421
Facility Status: Inactive. Included on a listing no longer updated.				
OLD SACRAMENTO JAIL	***620 H ST***	***SE 1/8 - 1/4 (0.246 mi.)***	***AB223***	***423***
Facility Status: Inactive. Included on a listing no longer updated.				
Facility Id: U0106586				
CITY OF SACRAMENTO	625 H ST	SE 1/8 - 1/4 (0.250 mi.)	AB226	426

CA HAZNET: The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000-1,000,000 annually, representing approximately 350,000-500,000 shipments. Data from non-California manifests & continuation sheets are not included at the present time. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, & disposal method. The source is the Department of Toxic Substance Control is the agency. This database begins with calendar year 1993.

A review of the CA HAZNET list, as provided by EDR, and dated 12/31/2013 has revealed that there are 10 CA HAZNET sites within approximately 0.001 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
YOLO COUNTY GENERAL	213 -4TH ST	0 - 1/8 (0.000 mi.)	D9	15
GEPAID: CAC001034712				
WEST SACRAMENTO REDE	424 C ST	0 - 1/8 (0.000 mi.)	E14	18
GEPAID: CAC002346225				
CITY OF SACRAMENTO	101 BERCUT	0 - 1/8 (0.000 mi.)	F30	31
GEPAID: CAD981667637				
AVANCED GIO ENVIRONM	319 3RD ST	0 - 1/8 (0.000 mi.)	G43	52
GEPAID: CAL000203183				
CITY OF WEST SACRAME	305 3RD ST	0 - 1/8 (0.000 mi.)	C46	64
GEPAID: CAC001370936				
CITY OF WEST SACRAME	320 2ND ST	0 - 1/8 (0.000 mi.)	G57	76
GEPAID: CAC002674749				
CITY OF WEST SACRAME	427 C ST	0 - 1/8 (0.000 mi.)	E67	90
GEPAID: CAC002670882				
CITY OF WEST SACRAME	350 C ST	0 - 1/8 (0.000 mi.)	C74	95
GEPAID: CAC001222784				
THIRD & C STREET LLC	281 3RD ST	0 - 1/8 (0.000 mi.)	C77	96
GEPAID: CAC002601517				
CITY OF SACRAMENTO -	JIBBOOM ST BRIDGE @	0 - 1/8 (0.000 mi.)	79	97
GEPAID: CAC002568375				

CA HWP: Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

A review of the CA HWP list, as provided by EDR, and dated 02/23/2015 has revealed that there are 2 CA HWP sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
UNION PACIFIC SACRAM	***501 JIBBOOM ST***	***SE 0 - 1/8 (0.032 mi.)***	***J90***	***133***
EPA Id: CAD073772030				
Cleanup Status: CLOSED				
CALTRANS HEADQUARTER	***1120 N ST***	***SE 1/2 - 1 (0.760 mi.)***	***310***	***656***
EPA Id: CAD981685563				
Cleanup Status: NON-OPERATING				

2020 COR ACTION: The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

A review of the 2020 COR ACTION list, as provided by EDR, and dated 04/22/2013 has revealed that there is 1 2020 COR ACTION site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
UNION PACIFIC SACRAM	***501 JIBBOOM ST***	***SE 0 - 1/8 (0.032 mi.)***	***J90***	***133***

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

A review of the EDR MGP list, as provided by EDR, has revealed that there are 3 EDR MGP sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
UP, DOWNTOWN SAC - M	400 I STREET	SE 0 - 1/8 (0.076 mi.)	L106	343
PG AND E SACRAMENTO	2000 FRONT STREET	S 1/2 - 1 (0.834 mi.)	BC315	700
PACIFIC GAS AND ELEC	101 U STREET	SSW 1/2 - 1 (0.996 mi.)	325	741

EXECUTIVE SUMMARY

EDR US Hist Auto Stat: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR US Hist Auto Stat list, as provided by EDR, has revealed that there are 31 EDR US Hist Auto Stat sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PARKINSON W A	521 C ST	0 - 1/8 (0.000 mi.)	B3	10
MARTINEZ S GULF SERV	424 C STREET	0 - 1/8 (0.000 mi.)	E13	18
COLE S SHELL SERVICE	500 C STREET	0 - 1/8 (0.000 mi.)	B16	19
FOSTER CHAS	319 3RD ST	0 - 1/8 (0.000 mi.)	G42	52
E & B AUTO SALES	301 C STREET	0 - 1/8 (0.000 mi.)	C59	79
SHEA T H	427 C ST	0 - 1/8 (0.000 mi.)	E68	90
DORRIS SHELL SERVICE	300 3RD ST	0 - 1/8 (0.000 mi.)	C71	92
BROWNS SERVICE	421 C STREET	0 - 1/8 (0.000 mi.)	E78	96
CRENSHAW CLYDE	442 2ND ST	SW 0 - 1/8 (0.002 mi.)	H80	97
BOCK F E	114 I ST	SSE 0 - 1/8 (0.036 mi.)	I95	339
JOHNNIE S CHEVRON SE	606 SACRAMENTO ST	W 0 - 1/8 (0.044 mi.)	K102	342
DEPOT AUTO SERVICE	400 I ST	SE 0 - 1/8 (0.076 mi.)	L107	344
CATHAY SERVICE STATI	430 I ST	SE 0 - 1/8 (0.079 mi.)	L109	348
SKELLY WM	611 WILLIAMS AVE	WNW 0 - 1/8 (0.111 mi.)	119	359
BOUGHTON W S	520 5TH ST	WSW 0 - 1/8 (0.116 mi.)	N126	364
JOHNNIE S CHEVRON SE	660 SACRAMENTO ST	W 0 - 1/8 (0.120 mi.)	128	365
HOY-BIN AUTO SERVICE	331 J ST	SSE 0 - 1/8 (0.123 mi.)	O129	365
Not reported	1008 2ND ST	SSE 1/8 - 1/4 (0.138 mi.)	P137	367
RAGSDALE J B	601 2ND ST	SSW 1/8 - 1/4 (0.139 mi.)	R139	368
BRODERICK AUTO SERVI	219 F ST	SSW 1/8 - 1/4 (0.142 mi.)	R140	368
Not reported	428 J ST	SSE 1/8 - 1/4 (0.146 mi.)	Q148	373
YANCEY FRED	308 F ST	SW 1/8 - 1/4 (0.155 mi.)	156	384
CECCARELLI LOUIS	1108 4TH ST	SSE 1/8 - 1/4 (0.157 mi.)	Q160	386
COMMERCIAL GARAGE RE	915 5TH ST	SE 1/8 - 1/4 (0.157 mi.)	S161	386
SELLINGER G P	521 I ST	SE 1/8 - 1/4 (0.170 mi.)	S169	389
DAL PORTO DOMENIC	523 I ST	SE 1/8 - 1/4 (0.171 mi.)	S170	389
DAL PORTO DOMINIC	522 I ST	SE 1/8 - 1/4 (0.172 mi.)	S171	389
THOMPSON S CHEVRON S	531 I STREET	SE 1/8 - 1/4 (0.177 mi.)	S172	390
ANDERSON F G	610 I ST	SE 1/8 - 1/4 (0.237 mi.)	AC213	416
JENNINGS CHAS	1130 2ND ST	S 1/8 - 1/4 (0.240 mi.)	AD216	417
DOSSMAN BROS REPAIR	217 BANNON ST	NNE 1/8 - 1/4 (0.243 mi.)	AE221	422

EDR US Hist Cleaners: EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR US Hist Cleaners list, as provided by EDR, has revealed that there are 58 EDR US

EXECUTIVE SUMMARY

Hist Cleaners sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SUNG LEE	223 3RD ST	0 - 1/8 (0.000 mi.)	C4	11
THRIFTY CLEANERS	322 3RD ST	0 - 1/8 (0.000 mi.)	G48	67
BRYSON DOUGLAS	211 D ST	0 - 1/8 (0.000 mi.)	H51	71
SING LEE	424 2ND ST	0 - 1/8 (0.000 mi.)	H52	71
C & J LAUNDROMAT	423 3RD ST	0 - 1/8 (0.000 mi.)	53	71
SING LEE	424 2D ST	0 - 1/8 (0.000 mi.)	55	73
SING CHONG	904 2ND ST	SSE 0 - 1/8 (0.032 mi.)	I81	97
VALLEY CLEANERS	907 2ND ST	SSE 0 - 1/8 (0.039 mi.)	I99	341
SHIRASAGO BENJ	911 2ND ST	SSE 0 - 1/8 (0.042 mi.)	I100	341
SUEY K CLEANING & LA	922 2ND ST	SSE 0 - 1/8 (0.048 mi.)	I103	343
SWANSON S CLEANERS S	620 SACRAMENTO	W 0 - 1/8 (0.055 mi.)	K104	343
SAM LIM	315 J ST	SSE 0 - 1/8 (0.108 mi.)	O117	359
SAM S LAUNDRY & DRY	304 J ST	SSE 0 - 1/8 (0.109 mi.)	O118	359
LEE SAM	225 J ST	SSE 0 - 1/8 (0.112 mi.)	P120	360
MIRO LAURENT	207 J ST	SSE 0 - 1/8 (0.112 mi.)	P121	360
HOP WO LAUNDRY	212 J ST	SSE 0 - 1/8 (0.114 mi.)	P124	363
WAH HOP	204 J ST	SSE 0 - 1/8 (0.114 mi.)	P125	363
FRIEDMAN ISADORE	1019 3RD ST	SSE 1/8 - 1/4 (0.127 mi.)	O130	365
LEE S ELLEN LAUNDRY	1021 3RD ST	SSE 1/8 - 1/4 (0.128 mi.)	O131	366
LEE IRENE MRS	902 4TH ST	SSE 1/8 - 1/4 (0.132 mi.)	Q133	366
Not reported	403 J ST	SSE 1/8 - 1/4 (0.133 mi.)	Q134	367
WAH LUN	908 4TH ST	SSE 1/8 - 1/4 (0.133 mi.)	Q135	367
WEISBERG DAVID	402 J ST	SSE 1/8 - 1/4 (0.134 mi.)	Q136	367
JAY STREET LAUNDRY	420 J ST	SSE 1/8 - 1/4 (0.142 mi.)	Q141	369
WRIGHT H A	1007 4TH ST	SSE 1/8 - 1/4 (0.145 mi.)	Q144	370
FONG MING	1016 4TH ST	SSE 1/8 - 1/4 (0.146 mi.)	Q145	371
FONG MING	1009 4TH ST	SSE 1/8 - 1/4 (0.146 mi.)	Q146	371
CHEW JACK	1019 4TH ST	SSE 1/8 - 1/4 (0.147 mi.)	Q150	374
LOTUS LAUNDRY	918 5TH ST	SE 1/8 - 1/4 (0.156 mi.)	S158	385
FONG LEE	1106 4TH ST	SSE 1/8 - 1/4 (0.157 mi.)	Q159	385
MYRICK A L	504 I ST	SE 1/8 - 1/4 (0.159 mi.)	S162	386
GOLD STAR LAUNDRY	1027 2ND ST	SSE 1/8 - 1/4 (0.161 mi.)	P163	386
FONG WEE	1026 2ND ST	SSE 1/8 - 1/4 (0.161 mi.)	P164	387
YOCUM J M	1028 2ND ST	SSE 1/8 - 1/4 (0.162 mi.)	P166	387
CHONG HOP	121 K ST	S 1/8 - 1/4 (0.185 mi.)	V176	392
BROWN J L	1004 5TH ST	SE 1/8 - 1/4 (0.187 mi.)	U177	392
GEE LAUNDRY	504 J ST	SE 1/8 - 1/4 (0.190 mi.)	U178	392
Not reported	550 7TH ST	WSW 1/8 - 1/4 (0.191 mi.)	179	392
ACME CLEANERS AND LA	1011 5TH ST	SE 1/8 - 1/4 (0.191 mi.)	U182	397
SHIMOTORI MINAO	205 K ST	S 1/8 - 1/4 (0.192 mi.)	V183	397
VETERANS CLEANERS	511 J STREET	SE 1/8 - 1/4 (0.192 mi.)	U184	398
FORT SUTTER LAUNDERL	243 K STREET	S 1/8 - 1/4 (0.192 mi.)	V185	398
MILLER JOHN	307 K ST	SSE 1/8 - 1/4 (0.193 mi.)	T186	398
OCK LEE HAND LAUNDRY	1021 5TH ST	SE 1/8 - 1/4 (0.197 mi.)	U187	399
SPOTLESS CLEANERS	1023 5TH ST	SE 1/8 - 1/4 (0.198 mi.)	U188	399
COHN HARRY	522 J ST	SE 1/8 - 1/4 (0.201 mi.)	U189	399
FONG SING HAND LAUND	527 J STREET	SE 1/8 - 1/4 (0.202 mi.)	U190	400
EAGLE CLEANERS	1125 3RD ST	SSE 1/8 - 1/4 (0.210 mi.)	194	401
NICHOLOPOULOS K A	423 K ST	SSE 1/8 - 1/4 (0.214 mi.)	Y196	403
PAPPAS LOUIS	422 K ST	SSE 1/8 - 1/4 (0.216 mi.)	Y197	403
BOYLE BROS	429 K ST	SSE 1/8 - 1/4 (0.216 mi.)	Y198	404
HING YEE	909 6TH ST	SE 1/8 - 1/4 (0.230 mi.)	AC206	411
DAGUE A C	921 6TH ST	SE 1/8 - 1/4 (0.232 mi.)	AC209	413
CHUNGKING LAUNDRY	1124 2ND ST	S 1/8 - 1/4 (0.234 mi.)	AD210	414
KING G L	1126 2ND ST	S 1/8 - 1/4 (0.238 mi.)	AD214	417

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MATORIAN ABR	1127 2ND ST	S 1/8 - 1/4 (0.238 mi.)	AD215	417
LUNG CHONG LAUNDRY	718 3RD ST	SW 1/8 - 1/4 (0.240 mi.)	AA217	418
ARTENIAN GEO	513 K ST	SSE 1/8 - 1/4 (0.249 mi.)	AF225	425

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

CA RGA LUST: The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

A review of the CA RGA LUST list, as provided by EDR, has revealed that there are 14 CA RGA LUST sites within approximately 0.001 miles of the target property.

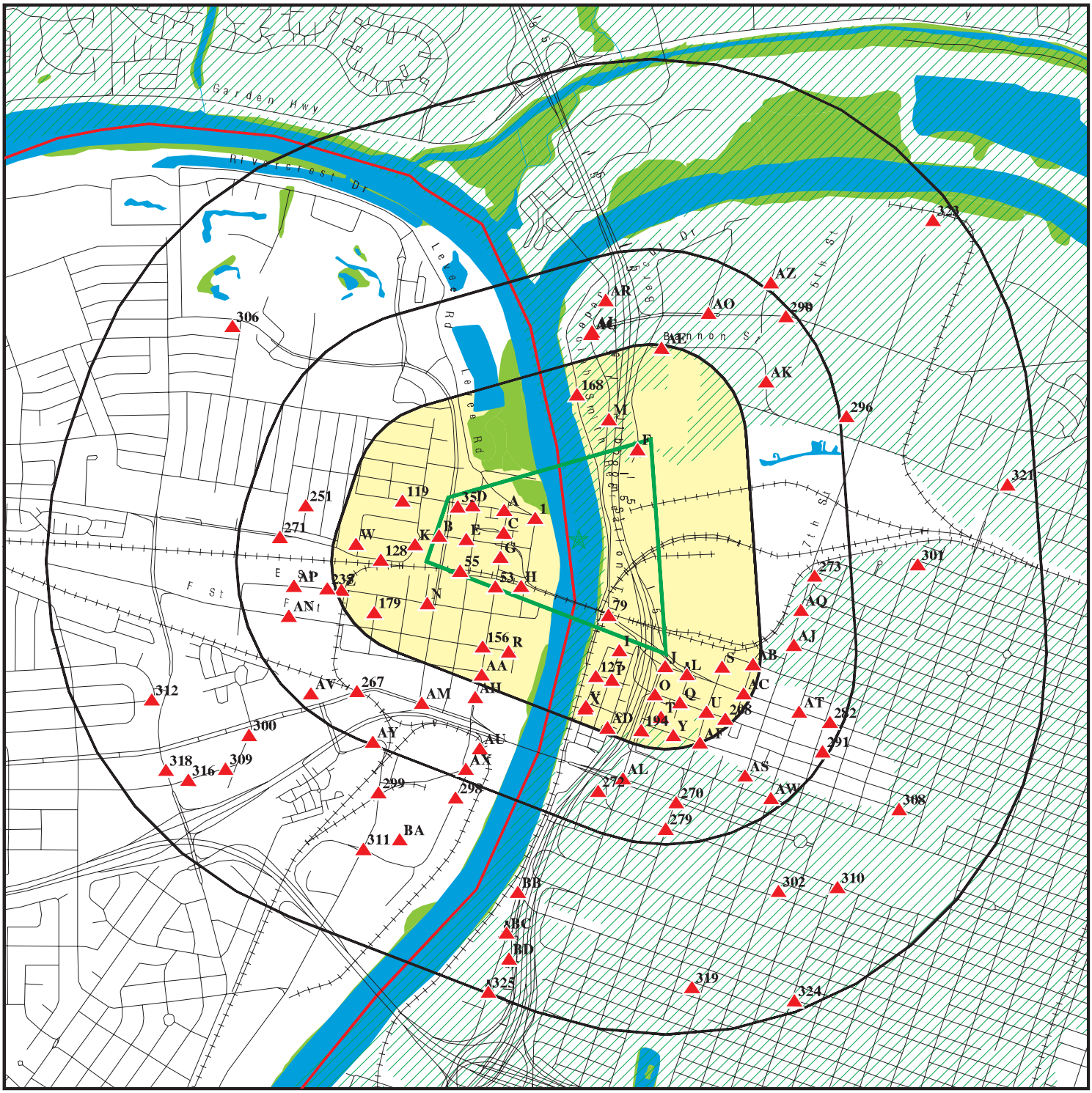
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
YOLO CO PUBLIC WORKS	4TH ST & B ST	0 - 1/8 (0.000 mi.)	D7	13
FORMER HUDSON OIL ST	500 C STREET	0 - 1/8 (0.000 mi.)	B15	19
FORMER HUDSON	500 C ST	0 - 1/8 (0.000 mi.)	B17	20
FORMER HUDSON (CLOSE	500 C ST	0 - 1/8 (0.000 mi.)	B18	20
COMMUN. CENTER	111 BERCUT DR	0 - 1/8 (0.000 mi.)	F22	26
COMMUNICATIONS CENTE	111 BERCUT DRIVE	0 - 1/8 (0.000 mi.)	F25	29
COMMUN. CENTER (CLOS	111 BERCUT DR	0 - 1/8 (0.000 mi.)	F26	29
YOLO CO PUBLIC WORKS	4TH ST/B ST	0 - 1/8 (0.000 mi.)	D31	33
YOLO COUNTY PUBLIC W	4TH ST/B ST	0 - 1/8 (0.000 mi.)	D32	33
YOLO CO PUBLIC WORKS	4TH ST & B ST	0 - 1/8 (0.000 mi.)	D33	33
GARY'S SERVICE CASE	427 C ST	0 - 1/8 (0.000 mi.)	E60	79
GARY'S MOWHAWK SERVI	427 C STREET	0 - 1/8 (0.000 mi.)	E62	80
GARY'S SERVICE	427 C ST	0 - 1/8 (0.000 mi.)	E69	91
GARY'S SERVICE	427 C STREET	0 - 1/8 (0.000 mi.)	E75	95

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 15 records.

Site Name	Database(s)
SMUD NORTH CITY SUBSTA	CERC-NFRAP
PG&E GAS PLANT SACRAMENTO 206 2	CERC-NFRAP
LOT X CITY OF SACRAMENTO DEVELOPME	CA LUST
TEXACO SERVICE STATION (FORMER)	CA LUST
SACRAMENTO DOWNTOWN ARENA	CA VCP, CA ENVIROSTOR
427 C STREET & 317 5TH STREET	US BROWNFIELDS, FINDS
MCCLELLAN AIR FORCE BASE (CLOSING	CA SLIC
SHRA I -5 SITES	CA SLIC
CALTRANS FRONT & "T" ST	CA SLIC
SACRAMENTO HOUSING & REDEVELOPMENT	CA SLIC
VOPAK USA INC. (FORMER VAN WATERS	CA SLIC
CAPITAL PLATING FACILITY (FORMER)*	CA SLIC
CITY OF SACRAMENTO	CA Sacramento Co. CS
METRO BURN PIT	CA Sacramento Co. CS
PRICE CO/DWR - RETENTION POND	CA Sacramento Co. CS

OVERVIEW MAP - 4267185.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	I Street Bridge	CLIENT:	Blackburn Consulting
ADDRESS:	I Street/Jibboom Street Sacramento CA 95814	CONTACT:	Laura Long
		INQUIRY #:	4267185.2s
LAT/LONG:	38.5886 / 121.5063	DATE:	April 16, 2015 6:39 pm

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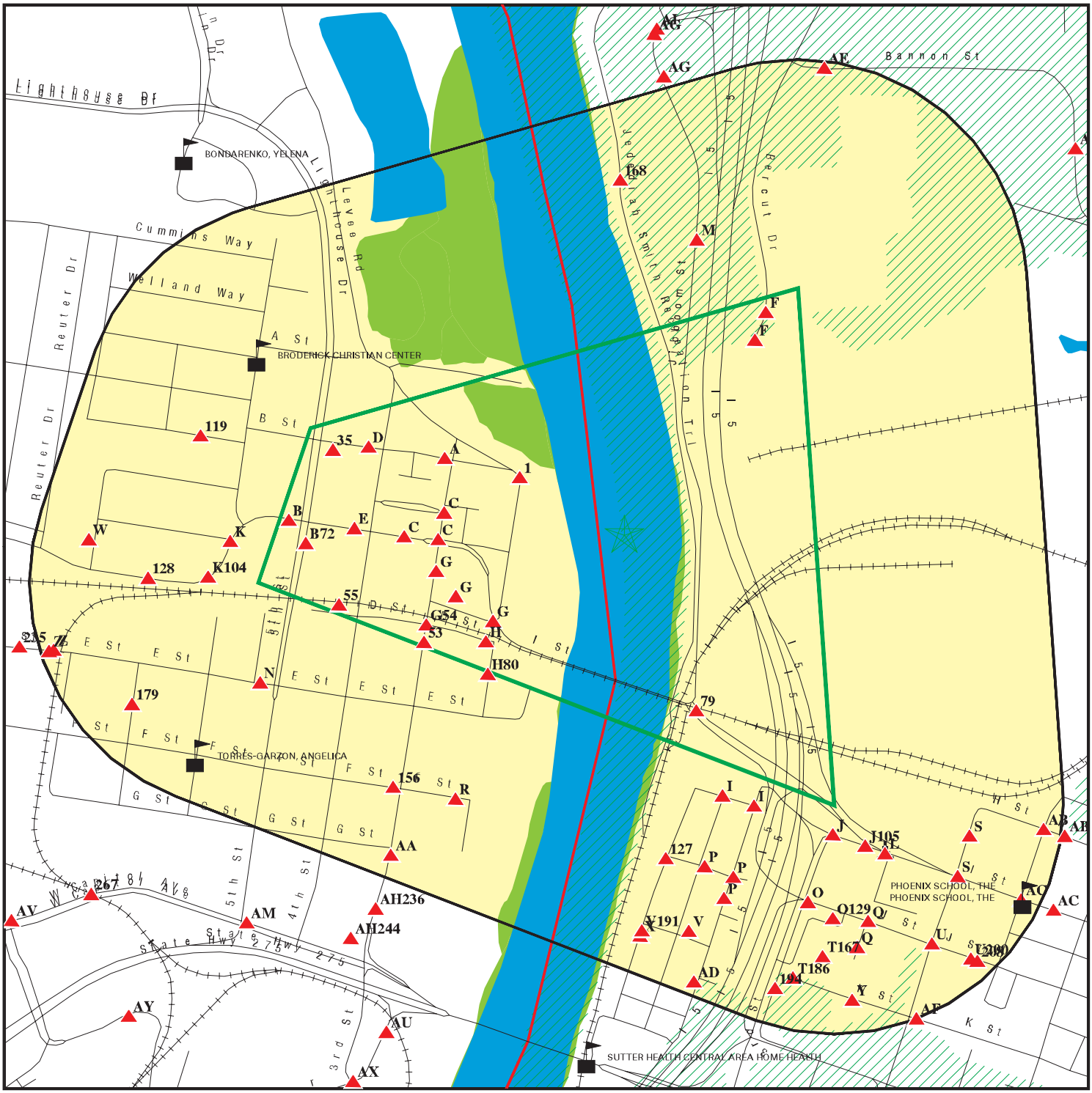
DETAIL MAP - 4267185.2S



0 1/8 1/4 1/2 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
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SITE NAME: I Street Bridge	CLIENT: Blackburn Consulting
ADDRESS: I Street/Jibboom Street Sacramento CA 95814	CONTACT: Laura Long
LAT/LONG: 38.5886 / 121.5063	INQUIRY #: 4267185.2s DATE: April 16, 2015 6:40 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	0.001		0	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	1	0	NR	1
Federal CERCLIS list								
CERCLIS	0.500		0	0	2	NR	NR	2
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP	0.500		1	0	0	NR	NR	1
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		1	0	0	0	NR	1
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		1	0	0	NR	NR	1
Federal RCRA generators list								
RCRA-LQG	0.250		2	0	NR	NR	NR	2
RCRA-SQG	0.250		4	3	NR	NR	NR	7
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
US ENG CONTROLS	0.500		0	0	1	NR	NR	1
US INST CONTROL	0.500		0	0	0	NR	NR	0
LUCIS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		1	NR	NR	NR	NR	1
State- and tribal - equivalent NPL								
CA RESPONSE	1.000		3	0	0	5	NR	8
State- and tribal - equivalent CERCLIS								
CA ENVIROSTOR	1.000		5	1	6	23	NR	35
State and tribal landfill and/or solid waste disposal site lists								
CA SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
CA LUST	0.500		9	4	41	NR	NR	54

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CA SLIC	0.500		3	1	4	NR	NR	8
CA Sacramento Co. CS	0.500		5	2	24	NR	NR	31
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
CA UST	0.250		11	5	NR	NR	NR	16
CA AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
FEMA UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
CA VCP	0.500		1	1	2	NR	NR	4
INDIAN VCP	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		6	0	7	NR	NR	13
Local Lists of Landfill / Solid Waste Disposal Sites								
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
CA SWRCY	0.500		0	0	1	NR	NR	1
CA HAULERS	0.001		0	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
CA WMUDS/SWAT	0.500		1	0	0	NR	NR	1
Local Lists of Hazardous waste / Contaminated Sites								
US CDL	0.001		0	NR	NR	NR	NR	0
CA HIST Cal-Sites	1.000		5	0	1	3	NR	9
CA SCH	0.250		0	0	NR	NR	NR	0
CA Toxic Pits	1.000		0	0	0	0	NR	0
CA CDL	0.001		0	NR	NR	NR	NR	0
US HIST CDL	0.001		0	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
CA FID UST	0.250		3	1	NR	NR	NR	4
CA HIST UST	0.250		10	4	NR	NR	NR	14
CA SWEEPS UST	0.250		3	2	NR	NR	NR	5
Local Land Records								
LIENS 2	0.001		0	NR	NR	NR	NR	0
CA LIENS	0.001		0	NR	NR	NR	NR	0
CA DEED	0.500		1	1	1	NR	NR	3
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
CA CHMIRS	0.001		6	NR	NR	NR	NR	6

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CA LDS	0.001		0	NR	NR	NR	NR	0
CA MCS	0.001		0	NR	NR	NR	NR	0
CA SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	2	NR	NR	NR	2
DOT OPS	0.001		0	NR	NR	NR	NR	0
DOD	1.000		0	0	0	0	NR	0
FUDS	1.000		0	0	0	1	NR	1
CONSENT	1.000		0	0	1	0	NR	1
ROD	1.000		0	0	1	0	NR	1
UMTRA	0.500		0	0	0	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
FINDS	0.001		9	NR	NR	NR	NR	9
RAATS	0.001		0	NR	NR	NR	NR	0
RMP	0.001		1	NR	NR	NR	NR	1
CA BOND EXP. PLAN	1.000		3	1	0	1	NR	5
CA NPDES	0.001		0	NR	NR	NR	NR	0
CA UIC	0.001		0	NR	NR	NR	NR	0
CA Cortese	0.500		3	0	0	NR	NR	3
CA HIST CORTESE	0.500		7	2	23	NR	NR	32
CA CUPA Listings	0.250		0	0	NR	NR	NR	0
NY MANIFEST	0.250		1	0	NR	NR	NR	1
CA Notify 65	1.000		0	0	1	1	NR	2
CA DRYCLEANERS	0.250		0	0	NR	NR	NR	0
CA WIP	0.250		0	0	NR	NR	NR	0
CA ENF	0.001		0	NR	NR	NR	NR	0
CA Sacramento Co. ML	0.250		7	24	NR	NR	NR	31
CA HAZNET	0.001		10	NR	NR	NR	NR	10
CA EMI	0.001		0	NR	NR	NR	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
CA MWMP	0.250		0	0	NR	NR	NR	0
CA HWP	1.000		1	0	0	1	NR	2
CA HWT	0.250		0	0	NR	NR	NR	0
CA PROC	0.500		0	0	0	NR	NR	0
CA Financial Assurance	0.001		0	NR	NR	NR	NR	0
CA WDS	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
2020 COR ACTION	0.250		1	0	NR	NR	NR	1
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		1	0	0	2	NR	3
EDR US Hist Auto Stat	0.250		17	14	NR	NR	NR	31
EDR US Hist Cleaners	0.250		17	41	NR	NR	NR	58
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
CA RGA LF	0.001		0	NR	NR	NR	NR	0
CA RGA LUST	0.001		14	NR	NR	NR	NR	14
- Totals --		0	174	109	117	37	0	437

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

1 **205 2ND STREET** **US BROWNFIELDS** **1011854972**
205 2ND STREET **FINDS** **N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
1 ft.

Relative: Higher

Actual: 16 ft.

US BROWNFIELDS:

Recipient name:	West Sacramento, City of
Grant type:	Assessment
Property name:	205 2ND STREET
Property #:	010-012-04
Parcel size:	.15
Property Description:	Historically the site contained a dwelling unit and out building until sometime after 1915 when the structures were demolished and a levy was built on the site. Since that time, the site has contained a levy that is part of the Sacramento River levy system.
Latitude:	38.58969
Longitude:	-121.50819
HCM label:	Interpolation-Photo
Map scale:	Not reported
Point of reference:	Entrance Point of a Facility or Station
Datum:	World Geodetic System of 1984
ACRES property ID:	70781
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	4138
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	EPA
Cleanup funding entity:	Not reported
Grant type:	N/A
Accomplishment type:	Phase I Environmental Assessment
Accomplishment count:	1
Cooperative agreement #:	96950001
Ownership entity:	Private
Current owner:	Eustace A Douglas, Jr
Did owner change:	N
Cleanup required:	Unknown
Video available:	No
Photo available:	Yes
Institutional controls required:	Not reported
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	Not reported
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported

205 2ND STREET (Continued) **1011854972**

Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Not reported
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Y
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Y
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Not reported
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	Not reported
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported
Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported
Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported

205 2ND STREET (Continued) **1011854972**

Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported

FINDS:

Registry ID: 110038732262

Environmental Interest/Information System
US EPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) is an federal online database for Brownfields Grantees to electronically submit data directly to EPA.

A2 **MONITORING STATION** **FINDS** **1008227103**
3RD & B ST **N/A**
< 1/8 **BRODERICK-BRYTE, CA 95605**
1 ft.

Site 1 of 3 in cluster A

Relative: Higher

FINDS:

Registry ID: 110020951763

Actual: 23 ft.

Environmental Interest/Information System
US EPA Air Quality System (AQS) contains ambient air pollution data collected by EPA, State, Local, and Tribal air pollution control agencies from thousands of monitoring stations.

B3 **PARKINSON W A** **EDR US Hist Auto Stat** **1009021542**
521 C ST **N/A**
< 1/8 **BRODERICK, CA**
1 ft.

Site 1 of 10 in cluster B

Relative: Higher

EDR Historical Auto Stations:

Name:	PARKINSON W A
Year:	1942
Type:	GASOLINE AND OIL SERVICE STATIONS

Actual: 23 ft.

Name:	PARKINSON W A
Year:	1947
Type:	AUTOMOBILE REPAIRING

PARKINSON W A (Continued) **1009021542**

Name: BARNHART EVERETT
Year: 1952
Type: AUTOMOBILE REPAIRING

Name: SENATOR GARAGE
Year: 1956
Type: AUTOMOBILE REPAIRING

Name: SENATOR GARAGE & SERVICE
Year: 1961
Type: AUTOMOBILE REPAIRING

Name: SENATOR GARAGE & AUTOMOTIVE MACHINE SHOP
Year: 1966
Type: AUTOMOBILE REPAIRING

Name: SENATOR GARAGE & AUTOMOTIVE MACHINE SHOP
Year: 1970
Type: AUTOMOBILE REPAIRING

Name: SENATOR GARAGE & AUTOMOTIVE MACHINE SHOP
Year: 1982
Type: AUTOMOBILE REPAIRING

C4 **SUNG LEE** **EDR US Hist Cleaners** **1009144733**
223 3RD ST **N/A**
< 1/8 **BRODERICK, CA**
1 ft.

Site 1 of 8 in cluster C

Relative: EDR Historical Cleaners:
Higher
Name: SUNG LEE
Year: 1923
Actual: Type: LAUNDRIES
20 ft.

Name: SUNG LEE
Year: 1923
Type: LAUNDRIES

A5 **CA CHMIRS** **S105671233**
3RD ST BETWEEN A & B ST. **N/A**
< 1/8 **DAVIS, CA**
1 ft.

Site 2 of 3 in cluster A

Relative: CHMIRS:
Higher
OES Incident Number: 01-6006
OES notification: 10/19/2001
Actual: OES Date: Not reported
23 ft. OES Time: Not reported
Incident Date: Not reported
Date Completed: **Not reported**
Property Use: Not reported
Agency Id Number: Not reported
Agency Incident Number: Not reported
Time Notified: Not reported

(Continued) **S105671233**

Time Completed:	Not reported	
Surrounding Area:	Not reported	
Estimated Temperature:	Not reported	
Property Management:	Not reported	
More Than Two Substances Involved?:		Not reported
Resp Agncy Personel # Of Decontaminated:		Not reported
Responding Agency Personel # Of Injuries:		Not reported
Responding Agency Personel # Of Fatalities:		Not reported
Others Number Of Decontaminated:		Not reported
Others Number Of Injuries:		Not reported
Others Number Of Fatalities:		Not reported
Vehicle Make/year:	Not reported	
Vehicle License Number:	Not reported	
Vehicle State:	Not reported	
Vehicle Id Number:	Not reported	
CA DOT PUC/ICC Number:	Not reported	
Company Name:	Not reported	
Reporting Officer Name/ID:	Not reported	
Report Date:	Not reported	
Facility Telephone:	Not reported	
Waterway Involved:	Yes	
Waterway:	Puddle	
Spill Site:	Not reported	
Cleanup By:	Unknown	
Containment:	Not reported	
What Happened:	Not reported	
Type:	Not reported	
Measure:	Not reported	
Other:	Not reported	
Date/Time:	Not reported	
Year:	2001	
Agency:	Citizen	
Incident Date:	10/19/200112:00:00 AM	
Admin Agency:	Yolo County Office of Emergency Services	
Amount:	Not reported	
Contained:	Yes	
Site Type:	Road	
E Date:	Not reported	
Substance:	Kerosine	
Gallons:	1	
Unknown:	0.000000	
Substance #2:	Not reported	
Substance #3:	Not reported	
Evacuations:	0	
Number of Injuries:	0	
Number of Fatalities:	0	
#1 Pipeline:	Not reported	
#2 Pipeline:	Not reported	
#3 Pipeline:	Not reported	
#1 Vessel >= 300 Tons:	Not reported	
#2 Vessel >= 300 Tons:	Not reported	
#3 Vessel >= 300 Tons:	Not reported	
Evacs:	Not reported	
Injuries:	Not reported	
Fatals:	Not reported	
Comments:	Not reported	
Description:	Citizen smelled substance and found substance in a puddle of water.	

(Continued) **S105671233**

along the roadway, during a walk. Puddle size is 15ft x 3ft

A6 **W SAC LIGHTHOUSE PUMP STATION** **CA UST** **U003640925**
310 B ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
1 ft.

Site 3 of 3 in cluster A

Relative:
Higher

Actual:
23 ft.

YOLO CO. UST:

Facility Id:	FA0000569
Owner Id:	OW0000105
Owner Name:	CITY OF WEST SACRAMENTO
Owner Address:	1951 SOUTH RIVER RD
Owner City/State/Zip:	WEST SACRAMENTO, CA 95691
Billing Name:	W SAC LIGHTHOUSE PUMP STATION
Billing Address1:	1951 S RIVER ROAD
Billing City/State/Zip:	WEST SACRAMENTO, CA 95691
Contact Name:	Not reported
Contact Phone:	Not reported
Current Status:	Inactive, non-billable
Program Element:	2306 - UST PERMANENT CLOSURE PERMIT
Business Code:	09 - UNKNOWN
Business Type:	6 - OTHER
Tank Number:	1
Tank Status:	Inactive
Tank Type:	Motor vehicle
Tank Description:	SINGLE-WALL
Tank Capacity:	2,000
Product Type:	Diesel
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	03/01/01
INVGEN:	1996000569

D7 **YOLO CO PUBLIC WORKS** **CA RGA LUST** **S114723850**
4TH ST & B ST **N/A**
< 1/8 **WEST SACRAMENTO, CA**
1 ft.

Site 1 of 10 in cluster D

Relative:
Higher

Actual:
22 ft.

RGA LUST:

2012	YOLO CO PUBLIC WORKS	4TH ST & B ST
2010	YOLO CO PUBLIC WORKS	4TH ST & B ST
2008	YOLO CO PUBLIC WORKS	4TH ST & B ST
2007	YOLO CO PUBLIC WORKS	4TH ST & B ST
2006	YOLO CO PUBLIC WORKS	4TH ST & B ST
2005	YOLO CO PUBLIC WORKS	4TH ST & B ST

D8 **YOLO CO PUBLIC WORKS/W SAC YD** **CA UST** **U004120315**
213 4TH ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95605**
1 ft.

Site 2 of 10 in cluster D

Relative:
Higher

Actual:
22 ft.

YOLO CO. UST:

Facility Id:	FA0000442
Owner Id:	OW0000353
Owner Name:	YOLO COUNTY PARKS
Owner Address:	120 W. MAIN ST., STE. C
Owner City/State/Zip:	WOODLAND, CA 95695
Billing Name:	YC PUBLIC WORKS W SAC CORP YD
Billing Address1:	292 W BEAMER ST
Billing City/State/Zip:	WOODLAND, CA 95695
Contact Name:	Not reported
Contact Phone:	916-666-8875, 916-666-2689
Current Status:	Inactive, non-billable
Program Element:	2306 - UST PERMANENT CLOSURE PERMIT
Business Code:	09 - UNKNOWN
Business Type:	6 - OTHER
Tank Number:	3
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	2,000
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	11/30/92
INVGEN:	1992000442
Tank Number:	1
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	2,000
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	11/30/92
INVGEN:	1992000442
Tank Number:	2
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	1,000
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	11/30/92
INVGEN:	1992000442

D9 **YOLO COUNTY GENERAL SVCS** **CA HAZNET** **S112861907**
213 -4TH ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95605**
1 ft.

Site 3 of 10 in cluster D

Relative:
Higher

Actual:
22 ft.

HAZNET:

envid:	S112861907
Year:	1995
GEPAID:	CAC001034712
Contact:	YOLO COUNTY GENERAL SVCS
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	625 COURT ST, #203
Mailing City,St,Zip:	WOODLAND, CA 956950000
Gen County:	Not reported
TSD EPA ID:	CAL000051079
TSD County:	Not reported
Waste Category:	Unspecified oil-containing waste
Disposal Method:	Transfer Station
Tons:	1.2093
Facility County:	Yolo

envid:	S112861907
Year:	1995
GEPAID:	CAC001034712
Contact:	YOLO COUNTY GENERAL SVCS
Telephone:	0000000000
Mailing Name:	Not reported
Mailing Address:	625 COURT ST, #203
Mailing City,St,Zip:	WOODLAND, CA 956950000
Gen County:	Not reported
TSD EPA ID:	CAD009466392
TSD County:	Not reported
Waste Category:	Other empty containers 30 gallons or more
Disposal Method:	Recycler
Tons:	2.5000
Facility County:	Yolo

B10 **GOLDEN EAGLE GARAGE** **CA UST** **U004003682**
519 C ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
1 ft.

Site 2 of 10 in cluster B

Relative:
Higher

Actual:
23 ft.

YOLO CO. UST:

Facility Id:	FA0000467
Owner Id:	OW0000374
Owner Name:	SORNSEN DOROTHY
Owner Address:	519 C ST
Owner City/State/Zip:	W SACRAMENTO, CA 95691
Billing Name:	GOLDEN EAGLE GARAGE
Billing Address1:	519 C STREET
Billing City/State/Zip:	WEST SACRAMENTO, CA 95691
Contact Name:	Not reported
Contact Phone:	Not reported
Current Status:	Inactive, non-billable
Program Element:	2306 - UST PERMANENT CLOSURE PERMIT
Business Code:	09 - UNKNOWN
Business Type:	6 - OTHER

GOLDEN EAGLE GARAGE (Continued) **U004003682**

Tank Number:	1
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	750
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	Not reported
INVGEN:	000467

Tank Number:	2
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	500
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	Not reported
INVGEN:	000467

Tank Number:	3
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	250
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	Not reported
INVGEN:	000467

B11 **FORMER HUDSON** **CA HIST CORTESE S102430246**
500 C ST **CA LUST N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
1 ft.

Site 3 of 10 in cluster B

Relative: Higher

Actual: 23 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	57
Reg By:	LTNKA
Reg Id:	570056

LUST:

Region:	STATE
Global Id:	T0611300035
Latitude:	38.589086
Longitude:	-121.513139
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	06/03/1987
Lead Agency:	YOLO COUNTY
Case Worker:	Not reported
Local Agency:	Not reported
RB Case Number:	570056

FORMER HUDSON (Continued) **S102430246**

LOC Case Number: Not reported
File Location: Not reported
Potential Media Affect: Soil
Potential Contaminants of Concern: Gasoline
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0611300035
Contact Type: Regional Board Caseworker
Contact Name: DAVID STAVAREK
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: dstavarek@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0611300035
Status: Open - Case Begin Date
Status Date: 06/03/1987

Global Id: T0611300035
Status: Completed - Case Closed
Status Date: 06/03/1987

Regulatory Activities:
Global Id: T0611300035
Action Type: Other
Date: 01/12/1990
Action: Leak Reported

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 570056
Case Type: Soil only
Substance: REGULR GASOLINE
Staff Initials: DFS
Lead Agency: Local
Program: LUST
MTBE Code: N/A

B12 **HUDSON (#138)** **CA HIST UST** **U001612326**
500 C ST **N/A**
< 1/8 **BRODERICK, CA 95605**
1 ft.

Site 4 of 10 in cluster B

Relative: Higher

Actual: 23 ft.

HIST UST:
Region: STATE
Facility ID: 00000060109
Facility Type: Gas Station
Other Type: Not reported
Contact Name: Not reported

HUDSON (#138) (Continued) **U001612326**

Telephone:	0000000000
Owner Name:	HUDSON OIL CO.
Owner Address:	717 N. HARWOOD
Owner City,St,Zip:	DALLAS, TX 75201
Total Tanks:	0002
Tank Num:	001
Container Num:	1
Year Installed:	Not reported
Tank Capacity:	00012000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	1/4
Leak Detection:	Stock Inventor
Tank Num:	002
Container Num:	2
Year Installed:	Not reported
Tank Capacity:	00012000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	1/4
Leak Detection:	Stock Inventor

E13 **MARTINEZ S GULF SERVICE** **EDR US Hist Auto Stat** **1009022650**
424 C STREET **N/A**
< 1/8 **BRODERICK, CA**
1 ft.

Site 1 of 15 in cluster E

Relative: Higher

EDR Historical Auto Stations:

Name:	MARTINEZ S GULF SERVICE
Year:	1966
Type:	GASOLINE STATIONS
Name:	GULF OIL STATION
Year:	1970
Type:	GASOLINE STATIONS
Name:	BOB S TOWING
Year:	1982
Type:	AUTOMOBILE REPAIRING

Actual: 24 ft.

E14 **WEST SACRAMENTO REDEVELOPMENT AGENCY INC** **CA HAZNET** **S112913898**
424 C ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
1 ft.

Site 2 of 15 in cluster E

Relative: Higher

HAZNET:

envid:	S112913898
Year:	2001
GEPAID:	CAC002346225
Contact:	KATHLEEN O'LEARY
Telephone:	9163735843
Mailing Name:	Not reported

Actual: 24 ft.

WEST SACRAMENTO REDEVELOPMENT AGENCY INC (Continued) **S112913898**

Mailing Address: 1315 HALYARD DR
Mailing City,St,Zip: WEST SACRAMENTO, CA 956910000
Gen County: Not reported
TSD EPA ID: CAD044003556
TSD County: Not reported
Waste Category: Unspecified oil-containing waste
Disposal Method: Transfer Station
Tons: 0.45
Facility County: Yolo

envid: S112913898
Year: 2001
GEPAID: CAC002346225
Contact: KATHLEEN O'LEARY
Telephone: 9163735843
Mailing Name: Not reported
Mailing Address: 1315 HALYARD DR
Mailing City,St,Zip: WEST SACRAMENTO, CA 956910000
Gen County: Not reported
TSD EPA ID: CAD044003556
TSD County: Not reported
Waste Category: Waste oil and mixed oil
Disposal Method: Transfer Station
Tons: 0.45
Facility County: Yolo

B15 **FORMER HUDSON OIL STATION** **CA RGA LUST** **S114622610**
500 C STREET **N/A**
< 1/8 **WEST SACRAMENTO, CA**
1 ft.

Site 5 of 10 in cluster B

Relative:
Higher

RGA LUST:
1992 FORMER HUDSON OIL STATION 500 C STREET

Actual:
23 ft.

B16 **COLE S SHELL SERVICE STATION** **EDR US Hist Auto Stat** **1009022673**
500 C STREET **N/A**
< 1/8 **BRODERICK, CA**
1 ft.

Site 6 of 10 in cluster B

Relative:
Higher

EDR Historical Auto Stations:
Name: COLE S SHELL SERVICE STATION
Year: 1966
Actual: Type: GASOLINE STATIONS
23 ft.

Name: HUDSON OIL CO
Year: 1982
Type: GASOLINE STATIONS

B17 **FORMER HUDSON** **CA RGA LUST** **S114622615**
500 C ST **N/A**
< 1/8 **WEST SACRAMENTO, CA**
1 ft.

Site 7 of 10 in cluster B

Relative: RGA LUST:
Higher

2012	FORMER HUDSON	500 C ST
2011	FORMER HUDSON	500 C ST
2010	FORMER HUDSON	500 C ST
2009	FORMER HUDSON	500 C ST
2008	FORMER HUDSON	500 C ST
2007	FORMER HUDSON	500 C ST
2006	FORMER HUDSON	500 C ST
2005	FORMER HUDSON	500 C ST
2003	FORMER HUDSON	500 C ST
2002	FORMER HUDSON	500 C ST
2000	FORMER HUDSON	500 C ST
1998	FORMER HUDSON	500 C ST
1997	FORMER HUDSON	500 C ST
1996	FORMER HUDSON	500 C ST
1995	FORMER HUDSON	500 C ST
1994	FORMER HUDSON	500 C ST

Actual:
23 ft.

B18 **FORMER HUDSON (CLOSED-CO)** **CA RGA LUST** **S114622608**
500 C ST **N/A**
< 1/8 **WEST SACRAMENTO, CA**
1 ft.

Site 8 of 10 in cluster B

Relative: RGA LUST:
Higher

1993	FORMER HUDSON (CLOSED-CO)	500 C ST

Actual:
23 ft.

B19 **ON THE BALL GRAPHICS** **CA UST** **U003981383**
500 C ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95605**
1 ft.

Site 9 of 10 in cluster B

Relative: YOLO CO. UST:
Higher

Facility Id:	FA0000250
Owner Id:	OW0000125
Owner Name:	MONCKTON FRANK
Owner Address:	111 HWY 16
Owner City/State/Zip:	W SACRAMENTO, CA 95691
Billing Name:	ON THE BALL GRAPHICS
Billing Address1:	111 HWY 16
Billing City/State/Zip:	WEST SACRAMENTO, CA 95691
Contact Name:	Not reported
Contact Phone:	Not reported
Current Status:	Inactive, non-billable
Program Element:	2306 - UST PERMANENT CLOSURE PERMIT
Business Code:	09 - UNKNOWN
Business Type:	6 - OTHER
Tank Number:	4
Tank Status:	Inactive
Tank Type:	Petroleum

Actual:
23 ft.

ON THE BALL GRAPHICS (Continued) **U003981383**

Tank Description:	DOUBLE-WALL
Tank Capacity:	550
Product Type:	Used Oil
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	01/01/00
INVGEN:	19 0000250

Tank Number:	1
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	12,000
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	01/01/00
INVGEN:	19 0000250

Tank Number:	2
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	12,000
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	01/01/00
INVGEN:	19 0000250

Tank Number:	3
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	8,000
Product Type:	Other
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	01/01/00
INVGEN:	19 0000250

D20 **YOLO CO PUBLIC WORKS** **CA LUST** **S110655965**
4TH ST & B ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
1 ft.

Site 4 of 10 in cluster D

Relative:
Higher

Actual:
22 ft.

LUST:

Region:	STATE
Global Id:	T0611300209
Latitude:	38.5698936
Longitude:	-121.5412225
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	01/01/1988
Lead Agency:	YOLO COUNTY
Case Worker:	Not reported
Local Agency:	Not reported

YOLO CO PUBLIC WORKS (Continued) **S110655965**

RB Case Number: 570262
LOC Case Number: Not reported
File Location: Not reported
Potential Media Affect: Soil
Potential Contaminants of Concern: Other Solvent or Non-Petroleum Hydrocarbon
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0611300209
Contact Type: Regional Board Caseworker
Contact Name: DAVID STAVAREK
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: dstavarek@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0611300209
Status: Open - Case Begin Date
Status Date: 01/01/1988

Global Id: T0611300209
Status: Completed - Case Closed
Status Date: 01/01/1988

Regulatory Activities:
Global Id: T0611300209
Action Type: Other
Date: 01/01/1988
Action: Leak Discovery

Global Id: T0611300209
Action Type: Other
Date: 05/03/1996
Action: Leak Reported

F21 **COMMUN. CENTER** **CA HIST CORTESE** **S102428057**
111 BERCUT DR **CA LUST** **N/A**
< 1/8 **SACRAMENTO, CA 95814** **CA Sacramento Co. CS**
1 ft. **CA Sacramento Co. ML**

Site 1 of 12 in cluster F

Relative: Higher

Actual: 22 ft.

HIST CORTESE:
Region: CORTESE
Facility County Code: 34
Reg By: LTNKA
Reg Id: 340081

LUST:
Region: STATE
Global Id: T0606700058
Latitude: 38.595263
Longitude: -121.502094

COMMUN. CENTER (Continued) **S102428057**

Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	07/18/1987
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	Not reported
Local Agency:	Not reported
RB Case Number:	340081
LOC Case Number:	R032
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Waste Oil / Motor / Hydraulic / Lubricating
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606700058
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Status History:

Global Id:	T0606700058
Status:	Open - Case Begin Date
Status Date:	05/06/1987
Global Id:	T0606700058
Status:	Completed - Case Closed
Status Date:	07/18/1987
Global Id:	T0606700058
Status:	Open - Site Assessment
Status Date:	05/12/1987

Regulatory Activities:

Global Id:	T0606700058
Action Type:	Other
Date:	05/06/1987
Action:	Leak Discovery
Global Id:	T0606700058
Action Type:	Other
Date:	05/12/1987
Action:	Leak Reported

LUST REG 5:

Region:	5
Status:	Case Closed
Case Number:	340081
Case Type:	Soil only
Substance:	WASTE OIL

COMMUN. CENTER (Continued) **S102428057**

Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

Sacramento Co. CS:
State Site Number: R032
Lead Staff: None assigned, H.
Lead Agency: HM
Remedial Action Taken: NO
Substance: Waste Oil
Date Reported: Not reported
Facility Id: RO0000235
Case Type: Not reported
Case Closed: Y
Date Closed: Not reported

Sacramento Co. ML:
Facility Id: Not reported
Facility Status: Not reported
FD: Not reported
Billing Codes BP: I
Billing Codes UST: I
WG Bill Code: I
Target Property Bill Cod: Not reported
Food Bill Code: Not reported
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: Not reported
UST Permit Dt: Not reported
UST Inspection Date: Not reported
UST Tank Test Date: Not reported
Number of Tanks: 1
UST Tank Test Date: Not reported
SIC Code: Not reported
Tier Permitting: Not reported
AST Bill Code: Not reported
CALARP Bill Code: Not reported

Facility Id: Not reported
Facility Status: Not reported
FD: Not reported
Billing Codes BP: A
Billing Codes UST: Not reported
WG Bill Code: I
Target Property Bill Cod: Not reported
Food Bill Code: Not reported
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: Not reported
UST Permit Dt: Not reported
UST Inspection Date: Not reported
UST Tank Test Date: Not reported
Number of Tanks: Not reported

COMMUN. CENTER (Continued) **S102428057**

UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported
Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	A
Billing Codes UST:	Not reported
WG Bill Code:	Not reported
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported
Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Government Agency-No Fee
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	50
Food Bill Code:	52
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

F22 **COMMUN. CENTER** **CA RGA LUST** **S114605459**
111 BERCUT DR **N/A**
< 1/8 **SACRAMENTO, CA**
1 ft.

Site 2 of 12 in cluster F

Relative: RGA LUST:
Higher

2012	COMMUN. CENTER	111 BERCUT DR
2011	COMMUN. CENTER	111 BERCUT DR
2010	COMMUN. CENTER	111 BERCUT DR
2009	COMMUN. CENTER	111 BERCUT DR
2008	COMMUN. CENTER	111 BERCUT DR
2007	COMMUN. CENTER	111 BERCUT DR
2006	COMMUN. CENTER	111 BERCUT DR
2005	COMMUN. CENTER	111 BERCUT DR
2004	COMMUN. CENTER	111 BERCUT DR
2003	COMMUN. CENTER	111 BERCUT DR
2002	COMMUN. CENTER	111 BERCUT DR
2001	COMMUN. CENTER	111 BERCUT DR
2000	COMMUN. CENTER	111 BERCUT DR
1998	COMMUN. CENTER	111 BERCUT DR
1997	COMMUN. CENTER	111 BERCUT DR
1996	COMMUN. CENTER	111 BERCUT DR
1995	COMMUN. CENTER	111 BERCUT DR
1994	COMMUN. CENTER	111 BERCUT DR

Actual:
22 ft.

F23 **CITY OF SACRAMENTO** **CA CHMIRS** **S102312649**
101 BERCUT DR **CA Sacramento Co. ML** **N/A**
< 1/8 **SACRAMENTO, CA 95811**
1 ft.

Site 3 of 12 in cluster F

Relative: CHMIRS:
Higher

OES Incident Number:	02-3345	
OES notification:	06/18/2002	
OES Date:	Not reported	
OES Time:	Not reported	
Incident Date:	Not reported	
Date Completed:	**Not reported**	
Property Use:	Not reported	
Agency Id Number:	Not reported	
Agency Incident Number:	Not reported	
Time Notified:	Not reported	
Time Completed:	Not reported	
Surrounding Area:	Not reported	
Estimated Temperature:	Not reported	
Property Management:	Not reported	
More Than Two Substances Involved?:		Not reported
Resp Agncy Personel # Of Decontaminated:		Not reported
Responding Agency Personel # Of Injuries:		Not reported
Responding Agency Personel # Of Fatalities:		Not reported
Others Number Of Decontaminated:		Not reported
Others Number Of Injuries:		Not reported
Others Number Of Fatalities:		Not reported
Vehicle Make/year:	Not reported	
Vehicle License Number:	Not reported	
Vehicle State:	Not reported	
Vehicle Id Number:	Not reported	
CA DOT PUC/ICC Number:	Not reported	
Company Name:	Not reported	

Actual:
22 ft.

CITY OF SACRAMENTO (Continued) **S102312649**

Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	No
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	City of Sacramento
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	2002
Agency:	Sacramento City F.D.
Incident Date:	6/18/200212:00:00 AM
Admin Agency:	Sacramento City Fire Department
Amount:	Not reported
Contained:	Yes
Site Type:	Treatment/Sewage Facility
E Date:	Not reported
Substance:	Radiation
Gallons:	0.000000
Unknown:	700
Substance #2:	Not reported
Substance #3:	Not reported
Evacuations:	0
Number of Injuries:	0
Number of Fatalities:	0
#1 Pipeline:	Not reported
#2 Pipeline:	Not reported
#3 Pipeline:	Not reported
#1 Vessel >= 300 Tons:	Not reported
#2 Vessel >= 300 Tons:	Not reported
#3 Vessel >= 300 Tons:	Not reported
Evacs:	Not reported
Injuries:	Not reported
Fatals:	Not reported
Comments:	Not reported
Description:	A 700 MicroRad reading from old tank from a water treatment facility

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	Not reported
Billing Codes UST:	Not reported
WG Bill Code:	Not reported
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported

CITY OF SACRAMENTO (Continued) **S102312649**

Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

Facility Id:	U0012886
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Government Agency-No Fee
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	50
Food Bill Code:	52
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Government Agency-No Fee
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	50
Food Bill Code:	52
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

F24 **SACRAMENTO RIVER WATER TREATME** **CA HIST UST** **U001615185**
101 BERCUT DR **N/A**
< 1/8 **SACRAMENTO, CA 95814**
1 ft.

Site 4 of 12 in cluster F

Relative: HIST UST:
Higher

Region:	STATE
Facility ID:	00000018385
Actual: Facility Type:	Other
22 ft. Other Type:	WATER TREATMENT PLAN
Contact Name:	LARRY COMARSH
Telephone:	9164495226
Owner Name:	CITY OF SACRAMENTO
Owner Address:	5730 24TH ST.
Owner City,St,Zip:	SACRAMENTO, CA 95822
Total Tanks:	0002
Tank Num:	001
Container Num:	W-102
Year Installed:	Not reported
Tank Capacity:	00000750
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	002
Container Num:	W-102
Year Installed:	Not reported
Tank Capacity:	00000750
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor

F25 **COMMUNICATIONS CENTER** **CA RGA LUST** **S114605462**
111 BERCUT DRIVE **N/A**
< 1/8 **SACRAMENTO, CA**
1 ft.

Site 5 of 12 in cluster F

Relative: RGA LUST:
Higher

1992	COMMUNICATIONS CENTER	111 BERCUT DRIVE

Actual:
22 ft.

F26 **COMMUN. CENTER (CLOSED-CO)** **CA RGA LUST** **S114605458**
111 BERCUT DR **N/A**
< 1/8 **SACRAMENTO, CA**
1 ft.

Site 6 of 12 in cluster F

Relative: RGA LUST:
Higher

1993	COMMUN. CENTER (CLOSED-CO)	111 BERCUT DR

Actual:
22 ft.

F27 **COMMUNICATION CENTER** **CA FID UST** **S101628190**
111 BERCUT DR **CA SWEEPS UST** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
1 ft.

Site 7 of 12 in cluster F

Relative:
Higher

Actual:
22 ft.

CA FID UST:

Facility ID:	34006512
Regulated By:	UTNKA
Regulated ID:	00018380
Cortese Code:	Not reported
SIC Code:	Not reported
Facility Phone:	9164495020
Mail To:	Not reported
Mailing Address:	5730 024TH ST
Mailing Address 2:	Not reported
Mailing City,St,Zip:	SACRAMENTO 95814
Contact:	Not reported
Contact Phone:	Not reported
DUNs Number:	Not reported
NPDES Number:	Not reported
EPA ID:	Not reported
Comments:	Not reported
Status:	Active

SWEEPS UST:

Status:	Active
Comp Number:	18380
Number:	9
Board Of Equalization:	44-019052
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	CC-101-D
SWRCB Tank Id:	34-000-018380-000001
Tank Status:	A
Capacity:	4000
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	DIESEL
Number Of Tanks:	1

F28 **SACRAMENTO COMMUNICATIONS CTR** **CA UST** **U003786734**
111 BERCUT DR **N/A**
< 1/8 **SACRAMENTO, CA 95814**
1 ft.

Site 8 of 12 in cluster F

Relative:
Higher

Actual:
22 ft.

UST:

Facility ID:	FA0008534
Permitting Agency:	SACRAMENTO COUNTY
Latitude:	38.596612
Longitude:	-121.500745

F29 **COMMUNICATION CENTER** **CA HIST UST** **U001615074**
111 BERCUT DR **N/A**
< 1/8 **SACRAMENTO, CA 95814**
1 ft.

Site 9 of 12 in cluster F

Relative:
Higher

Actual:
22 ft.

HIST UST:

Region:	STATE
Facility ID:	00000018380
Facility Type:	Other
Other Type:	COMMUNICATION CT.
Contact Name:	TOM STARK
Telephone:	9164495020
Owner Name:	CITY OF SACRAMENTO
Owner Address:	5730 24TH ST.
Owner City,St,Zip:	SACRAMENTO, CA 95822
Total Tanks:	0001
Tank Num:	001
Container Num:	CC-101-D
Year Installed:	1983
Tank Capacity:	00004000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor

F30 **CITY OF SACRAMENTO** **CA HAZNET** **S113009788**
101 BERCUT **N/A**
< 1/8 **SACRAMENTO, CA 95814**
1 ft.

Site 10 of 12 in cluster F

Relative:
Higher

Actual:
22 ft.

HAZNET:

envid:	S113009788
Year:	2013
GEPAID:	CAD981667637
Contact:	DAN DRISCOLL
Telephone:	9168082276
Mailing Name:	Not reported
Mailing Address:	915 I ST.
Mailing City,St,Zip:	SACRAMENTO, CA 95814
Gen County:	Sacramento
TSD EPA ID:	CAD982042475
TSD County:	Solano
Waste Category:	Not reported
Disposal Method:	Landfill Or Surface Impoundment That Will Be Closed As Landfill(To Include On-Site Treatment And/Or Stabilization)
Tons:	0.4
Facility County:	Not reported
envid:	S113009788
Year:	2013
GEPAID:	CAD981667637
Contact:	DAN DRISCOLL
Telephone:	9168082276
Mailing Name:	Not reported
Mailing Address:	915 I ST.
Mailing City,St,Zip:	SACRAMENTO, CA 95814
Gen County:	Sacramento

CITY OF SACRAMENTO (Continued) **S113009788**

TSD EPA ID: CAD008364432
TSD County: Los Angeles
Waste Category: Not reported
Disposal Method: Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons: 0.2151
Facility County: Not reported

envid: S113009788
Year: 2012
GEPAID: CAD981667637
Contact: DAN DRISCOLL
Telephone: 9168082276
Mailing Name: Not reported
Mailing Address: 915 I ST
Mailing City,St,Zip: SACRAMENTO, CA 958140000
Gen County: Sacramento
TSD EPA ID: CAD008364432
TSD County: Los Angeles
Waste Category: Not reported
Disposal Method: Not reported
Tons: 0.095
Facility County: Sacramento

envid: S113009788
Year: 2012
GEPAID: CAD981667637
Contact: DAN DRISCOLL
Telephone: 9168082276
Mailing Name: Not reported
Mailing Address: 915 I ST
Mailing City,St,Zip: SACRAMENTO, CA 958140000
Gen County: Sacramento
TSD EPA ID: CAD008364432
TSD County: Los Angeles
Waste Category: Not reported
Disposal Method: Not reported
Tons: 0.095
Facility County: Sacramento

envid: S113009788
Year: 2012
GEPAID: CAD981667637
Contact: DAN DRISCOLL
Telephone: 9168082276
Mailing Name: Not reported
Mailing Address: 915 I ST
Mailing City,St,Zip: SACRAMENTO, CA 958140000
Gen County: Sacramento
TSD EPA ID: CAD980887418
TSD County: Alameda
Waste Category: Not reported
Disposal Method: Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons: 0.125
Facility County: Sacramento

CITY OF SACRAMENTO (Continued) **S113009788**

Click this hyperlink while viewing on your computer to access
37 additional CA_HAZNET: record(s) in the EDR Site Report.

D31 **YOLO CO PUBLIC WORKS** **CA RGA LUST** **S114723852**
4TH ST/B ST **N/A**
< 1/8 **WEST SACRAMENTO, CA**
1 ft.

Site 5 of 10 in cluster D

Relative:
Higher

Actual:
22 ft.

RGA LUST:

1998	YOLO CO PUBLIC WORKS	4TH ST/B ST
1997	YOLO CO PUBLIC WORKS	4TH ST/B ST
1996	YOLO CO PUBLIC WORKS	4TH ST/B ST

D32 **YOLO COUNTY PUBLIC WORKS** **CA RGA LUST** **S114723860**
4TH ST/B ST **N/A**
< 1/8 **WEST SACRAMENTO, CA**
1 ft.

Site 6 of 10 in cluster D

Relative:
Higher

Actual:
22 ft.

RGA LUST:

1995	YOLO COUNTY PUBLIC WORKS	4TH ST/B ST
1994	YOLO COUNTY PUBLIC WORKS	4TH ST/B ST
1993	YOLO COUNTY PUBLIC WORKS	4TH ST/B ST

D33 **YOLO CO PUBLIC WORKS** **CA RGA LUST** **S114723848**
4TH ST & B ST **N/A**
< 1/8 **WEST SACRAMENTO, CA**
1 ft.

Site 7 of 10 in cluster D

Relative:
Higher

Actual:
22 ft.

RGA LUST:

2011	YOLO CO PUBLIC WORKS	4TH ST & B ST
2003	YOLO CO PUBLIC WORKS	4TH ST & B ST
2000	YOLO CO PUBLIC WORKS	4TH ST & B ST

D34 **YOLO CO PUBLIC WORKS** **CA HIST CORTESE** **S105027375**
4TH ST & B ST **CA LUST** **N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
1 ft.

Site 8 of 10 in cluster D

Relative:
Higher

Actual:
22 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	57
Reg By:	LTNKA
Reg Id:	570262

LUST REG 5:

Region:	5
Status:	Case Closed
Case Number:	570262
Case Type:	Soil only

YOLO CO PUBLIC WORKS (Continued) **S105027375**

Substance: HYDROCARBONS
Staff Initials: DFS
Lead Agency: Local
Program: LUST
MTBE Code: N/A

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35 **BRODERICK CORPORATION YARD** **CA HIST UST** **U001612318**
FOURTH STREET AT "B" STREET **N/A**
< 1/8 **BRODERICK, CA 95605**
1 ft.

Relative:
Higher

Actual:
23 ft.

HIST UST:

Region:	STATE
Facility ID:	00000011456
Facility Type:	Other
Other Type:	ROAD MAINTENANCE
Contact Name:	JOSE GUARDADO
Telephone:	9163722108
Owner Name:	COUNTY OF YOLO, DEPT. OF PUBLI
Owner Address:	292 W. BEAMER STREET
Owner City,St,Zip:	WOODLAND, CA 95695
Total Tanks:	0003
Tank Num:	001
Container Num:	1
Year Installed:	1975
Tank Capacity:	00002000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	002
Container Num:	2
Year Installed:	1964
Tank Capacity:	00002000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	003
Container Num:	3
Year Installed:	1964
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor

F36 **SACRAMENTO RIVER WATER TREATMENT PLANT** **RMP** **1011836452**
101 BERCUTT DR. **N/A**
< 1/8 **SACRAMENTO, CA 95814**
1 ft.

Site 11 of 12 in cluster F

Relative:
Higher

Actual:
23 ft.

RMP:

Facility ID:	39742
LEPC city:	Inland Region 4 LEPC
Facility decimal latitude:	38.594722
Facility decimal longitude:	-121.498611
Is facility in county box:	T
LatLong method:	I4
LatLong description:	PU
Home page web address:	Not reported
Facility telephone:	Not reported
Facility email:	Not reported
Facility DUNS #:	0
Parent's name:	City of Sacramento, Department of Utilities
Partner's name:	Not reported
Parent's DUNS #:	0
Partner's DUNS #:	0
Operator's name:	City of Sacramento, Utilities Dept.
Operator's telephone:	9168081400
Operator's address:	1395 35th Avenue
Operators City,St,Zip:	Sacramento, CA 95822
RMP implementation contact:	Not reported
RMP contact title:	Water and Sewer Superintendent
Emergency contact:	Steve Willey
Emergency contact title:	Supervising Plant Operator
Emergency contact telephone:	9168083712
24 hour emergency telephone:	2097451319
Emergency contact ext/pin #:	Not reported
Number of full time employees:	25
EPA ID:	Not reported
Facility ID provided by CEPPO:	100000058787
Is facility covered by OSHA PSM:	T
Is facility covered by EPCRA 302:	T
Is fac. covered by CAA Title V 112(2):	F
Clean air op. permit/State ID:	Not reported
Last safety insp. dat:	2003-09-04 00:00:00
Inspected by:	State environmental agency
Is it OSHA approved with star/merit ranking:	False
Will RMP involve predictive filing:	False
Submission type:	Resubmission
RMP description:	Not reported
Facility has no accident hist. recs:	False
Foreign owner's address:	Not reported
Foreign owner's zip:	Not reported
Foreign owner's country:	Not reported
Claim # of employees as CBI:	False
Date RMP accepted by EPA:	2004-09-03 00:00:00
Date of error Report:	Not reported
Date RMP received:	2004-08-09 00:00:00
Does RMP contain graphics files:	False
Does RMP contain attachments:	False
Was certification letter received:	True
RMP submission method:	RMP*Submit
Does RMP contain CBI substantiation:	False

SACRAMENTO RIVER WATER TREATMENT PLANT (Continued) **1011836452**

Does RMP contain electronic waiver: False
Date RMP postmarked: 2004-07-30 00:00:00
Is RMP complete: True
Date of de-registration: Not reported
Date de-registration is effective: Not reported
Aniversary date: 2009-07-30 00:00:00
Does RMP contain CBI data: False
Does RMP contain unsanitized CBI version: False
RMP version #: 3.2
FRS latitude: 38.591810000000002
FRS longitude: -121.50376
FRS Description: PLANT ENTRANCE (GENERAL)
FRS Method: ADDRESS MATCHING-HOUSE NUMBER

RMP:
Process ID: 57127
NA & Industry Classification Sys.code(s): 22131
NAICS code description: Water Supply and Irrigation Systems
Optional facility description: Not reported
Program level: 3
Record contains CBI data: False

RMP:
Chemical name: Public OCA Chemical
Process chemical qty in 100s lbs: 0
Process flammable chemical name: Not reported

RMP:
Percent weight of chemical: 100
Physical state: a
Analytical basic: EPA’s RMP*Comp(TM)
Scenario: Not reported
Quantity released in pounds: Not reported
Release duration in minutes: Not reported
Release rate in pounds per second: Not reported
Wind speed in meters/second: 3
Stability class: D
Topography: a
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported
Active mitigation: Neutralization, Scrubbers, Emergency shutdown, Hazmat Response Action

RMP:
Percent weight of chemical: 100
Physical state: a
Analytical basic: EPA’s RMP*Comp(TM)
Scenario: Not reported
Quantity released in pounds: Not reported
Release duration in minutes: 10
Release rate in pounds per second: Not reported
Wind speed in meters/second: 1.5
Stability class: F
Topography: a
Distance to endpoint in miles: Not reported
Residential population: Not reported

SACRAMENTO RIVER WATER TREATMENT PLANT (Continued) **1011836452**

Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported

RMP:
Endpoint used: Not reported
LFL value: Not reported
Analytical basic: Not reported
Scenario: Not reported
Quantity released in pounds: Not reported
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported
Active mitigation: Not reported

RMP:
Analytical basic: Not reported
Quantity released in pounds: Not reported
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported
Safety review date: Not reported
Most recent PHA date: Not reported
Process Hazard Analysis: Not reported
Expected PHA changes completion date: Not reported
Major Hazard: Not reported
Process Control: Not reported
Mitigation Systems: Not reported
Monitoring/Detection: Not reported
Changes since the last process hazard analysis: Not reported
Most recent review of op. procedures: Not reported
Most recent training progs review/update: Not reported
Training: Not reported
Competency testing: Not reported
Most recent maintenance review date: Not reported
Most recent equipment inspection date: Not reported
Equipment tested: Not reported
Most recent changes by mgmt: Not reported
Date of most recent review/update: Not reported
Date of pre-start review: Not reported
Most recent compliance audit date: Not reported
Expected date of audit completion: Not reported
Most recent incident investigation: Not reported
Expected date of investigation changes: Not reported
Date of participation plan review: Not reported
Date of hot work permit review: Not reported
Date of contractor safety review: Not reported
Date of contractor safety eval. review: Not reported
Record has CBI data: Not reported
Safety review date: Not reported
Federal Regulation: Not reported
Federal regulation comment: Not reported
Major Hazard: Not reported
Process Control: Not reported

SACRAMENTO RIVER WATER TREATMENT PLANT (Continued) **1011836452**

Mitigation Systems: Not reported
Monitoring/Detection: Not reported
Changes since the last process hazard analysis: Not reported
Most recent hazard review/update: Not reported
Most recent review of op. procedures: Not reported
Most recent training progs review/update: Not reported
Expected completion of review changes: Not reported
Training: Not reported
Competency testing: Not reported
Most recent maintenance review date: Not reported
Most recent equipment inspection date: Not reported
Equipment tested: Not reported
Most recent compliance audit date: Not reported
Expected date of audit completion: Not reported
Most recent incident investigation: Not reported
Expected date of investigation changes: Not reported
Record has CBI data: Not reported
Date of most recent changes: Not reported
Chemical name: Chlorine
Process chemical qty in 100s lbs: 48000
Process flammable chemical name: Not reported

RMP:
Percent weight of chemical: Not reported
Physical state: Not reported
Analytical basic: Not reported
Scenario: Not reported
Quantity released in pounds: Not reported
Release duration in minutes: Not reported
Release rate in pounds per second: Not reported
Wind speed in meters/second: Not reported
Stability class: Not reported
Topography: Not reported
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported
Active mitigation: Not reported

RMP:
Percent weight of chemical: Not reported
Physical state: Not reported
Analytical basic: Not reported
Scenario: Not reported
Quantity released in pounds: Not reported
Release duration in minutes: Not reported
Release rate in pounds per second: Not reported
Wind speed in meters/second: Not reported
Stability class: Not reported
Topography: Not reported
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported

RMP:
Endpoint used: Not reported

SACRAMENTO RIVER WATER TREATMENT PLANT (Continued) **1011836452**

LFL value: Not reported
Analytical basic: Not reported
Scenario: Not reported
Quantity released in pounds: Not reported
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported
Active mitigation: Not reported

RMP:
Analytical basic: Not reported
Quantity released in pounds: Not reported
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported
Safety review date: Not reported
Most recent PHA date: Not reported
Process Hazard Analysis: Not reported
Expected PHA changes completion date: Not reported
Major Hazard: Not reported
Process Control: Not reported
Mitigation Systems: Not reported
Monitoring/Detection: Not reported
Changes since the last process hazard analysis: Not reported
Most recent review of op. procedures: Not reported
Most recent training progs review/update: Not reported
Training: Not reported
Competency testing: Not reported
Most recent maintenance review date: Not reported
Most recent equipment inspection date: Not reported
Equipment tested: Not reported
Most recent changes by mgmt: Not reported
Date of most recent review/update: Not reported
Date of pre-start review: Not reported
Most recent compliance audit date: Not reported
Expected date of audit completion: Not reported
Most recent incident investigation: Not reported
Expected date of investigation changes: Not reported
Date of participation plan review: Not reported
Date of hot work permit review: Not reported
Date of contractor safety review: Not reported
Date of contractor safety eval. review: Not reported
Record has CBI data: Not reported
Safety review date: Not reported
Federal Regulation: Not reported
Federal regulation comment: Not reported
Major Hazard: Not reported
Process Control: Not reported
Mitigation Systems: Not reported
Monitoring/Detection: Not reported
Changes since the last process hazard analysis: Not reported
Most recent hazard review/update: Not reported
Most recent review of op. procedures: Not reported
Most recent training progs review/update: Not reported

SACRAMENTO RIVER WATER TREATMENT PLANT (Continued) **1011836452**

Expected completion of review changes:	Not reported
Training:	Not reported
Competency testing:	Not reported
Most recent maintenance review date:	Not reported
Most recent equipment inspection date:	Not reported
Equipment tested:	Not reported
Most recent compliance audit date:	Not reported
Expected date of audit completion:	Not reported
Most recent incident investigation:	Not reported
Expected date of investigation changes:	Not reported
Record has CBI data:	Not reported
Date of most recent changes:	Not reported

RMP:

ER plan:	Not reported
ER plan most recent review date:	2004-06-17 00:00:00
ER plan most recent employee training date:	2004-03-23 00:00:00
Local agency coordinating ER plan:	Sacramento Fire Department
Telephone of the coordinating local agency:	9160000911
Federal regulation:	True
OSHA 1910 120:	True
SPCC:	False
RCRA:	False
OPA 90:	False
EPCRA:	False
Other Regulations:	Not reported

RMP:

Facility ID:	19663
LEPC city:	Not reported
Facility decimal latitude:	38.592778
Facility decimal longitude:	-121.502222
Is facility in county box:	T
LatLong method:	I4
LatLong description:	CE
Home page web address:	Not reported
Facility telephone:	Not reported
Facility email:	Not reported
Facility DUNS #:	0
Parent's name:	City of Sacramento
Partner's name:	Not reported
Parent's DUNS #:	0
Partner's DUNS #:	0
Operator's name:	City of Sacramento Dept. of Util.
Operator's telephone:	9162641400
Operator's address:	1395 35th Ave.
Operators City,St,Zip:	Sacramento, CA 95822
RMP implementation contact:	Jim Sequira
RMP contact title:	Director of Utilities
Emergency contact:	Steve Willey
Emergency contact title:	Supervising Plant Operator
Emergency contact telephone:	9163823712
24 hour emergency telephone:	2097451319
Emergency contact ext/pin #:	Not reported
Number of full time employees:	20
EPA ID:	Not reported
Facility ID provided by CEPPO:	100000058787

SACRAMENTO RIVER WATER TREATMENT PLANT (Continued) **1011836452**

Is facility covered by OSHA PSM: T
Is facility covered by EPCRA 302: F
Is fac. covered by CAA Title V 112(2): F
Clean air op. permit/State ID: Not reported
Last safety insp. dat: 1998-11-01 00:00:00
Inspected by: Fire Department
Is it OSHA approved with star/merit ranking: False
Will RMP involve predictive filing: False
Submission type: First Time
RMP description: Not reported
Facility has no accident hist. recs: True
Foreign owner's address: Not reported
Foreign owner's zip: Not reported
Foreign owner's country: Not reported
Claim # of employees as CBI: False
Date RMP accepted by EPA: 2000-01-20 00:00:00
Date of error Report: Not reported
Date RMP received: 1999-06-18 00:00:00
Does RMP contain graphics files: False
Does RMP contain attachments: False
Was certification letter received: True
RMP submission method: RMP*Submit
Does RMP contain CBI substantiation: False
Does RMP contain electronic waiver: False
Date RMP postmarked: 1999-06-15 00:00:00
Is RMP complete: True
Date of de-registration: Not reported
Date de-registration is effective: Not reported
Aniversary date: 2004-06-15 00:00:00
Does RMP contain CBI data: False
Does RMP contain unsanitized CBI version: False
RMP version #: 1.2.4
FRS latitude: 38.591810000000002
FRS longitude: -121.50376
FRS Description: PLANT ENTRANCE (GENERAL)
FRS Method: ADDRESS MATCHING-HOUSE NUMBER

RMP:
Process ID: 27601
NA & Industry Classification Sys.code(s): 92411
NAICS code description: Air and Water Resource and Solid Waste Management
Optional facility description: Chlorine Handling
Program level: 3
Record contains CBI data: False

RMP:
Chemical name: Chlorine
Process chemical qty in 100s lbs: 102400
Process flammable chemical name: Not reported

RMP:
Percent weight of chemical: Not reported
Physical state: Not reported
Analytical basic: Not reported
Scenario: Not reported
Quantity released in pounds: Not reported
Release duration in minutes: Not reported
Release rate in pounds per second: Not reported

SACRAMENTO RIVER WATER TREATMENT PLANT (Continued) **1011836452**

Wind speed in meters/second: Not reported
Stability class: Not reported
Topography: Not reported
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported
Active mitigation: Not reported

RMP:
Percent weight of chemical: Not reported
Physical state: Not reported
Analytical basic: Not reported
Scenario: Not reported
Quantity released in pounds: Not reported
Release duration in minutes: Not reported
Release rate in pounds per second: Not reported
Wind speed in meters/second: Not reported
Stability class: Not reported
Topography: Not reported
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported

RMP:
Endpoint used: Not reported
LFL value: Not reported
Analytical basic: Not reported
Scenario: Not reported
Quantity released in pounds: Not reported
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported
Active mitigation: Not reported

RMP:
Analytical basic: Not reported
Quantity released in pounds: Not reported
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported
Safety review date: Not reported
Most recent PHA date: Not reported
Process Hazard Analysis: Not reported
Expected PHA changes completion date: Not reported
Major Hazard: Not reported
Process Control: Not reported
Mitigation Systems: Not reported
Monitoring/Detection: Not reported
Changes since the last process hazard analysis: Not reported
Most recent review of op. procedures: Not reported
Most recent training progs review/update: Not reported

SACRAMENTO RIVER WATER TREATMENT PLANT (Continued) **1011836452**

Training: Not reported
Competency testing: Not reported
Most recent maintenance review date: Not reported
Most recent equipment inspection date: Not reported
Equipment tested: Not reported
Most recent changes by mgmt: Not reported
Date of most recent review/update: Not reported
Date of pre-start review: Not reported
Most recent compliance audit date: Not reported
Expected date of audit completion: Not reported
Most recent incident investigation: Not reported
Expected date of investigation changes: Not reported
Date of participation plan review: Not reported
Date of hot work permit review: Not reported
Date of contractor safety review: Not reported
Date of contractor safety eval. review: Not reported
Record has CBI data: Not reported
Safety review date: Not reported
Federal Regulation: Not reported
Federal regulation comment: Not reported
Major Hazard: Not reported
Process Control: Not reported
Mitigation Systems: Not reported
Monitoring/Detection: Not reported
Changes since the last process hazard analysis: Not reported
Most recent hazard review/update: Not reported
Most recent review of op. procedures: Not reported
Most recent training progs review/update: Not reported
Expected completion of review changes: Not reported
Training: Not reported
Competency testing: Not reported
Most recent maintenance review date: Not reported
Most recent equipment inspection date: Not reported
Equipment tested: Not reported
Most recent compliance audit date: Not reported
Expected date of audit completion: Not reported
Most recent incident investigation: Not reported
Expected date of investigation changes: Not reported
Record has CBI data: Not reported
Date of most recent changes: Not reported
Chemical name: Public OCA Chemical
Process chemical qty in 100s lbs: 0
Process flammable chemical name: Not reported

RMP:
Percent weight of chemical: 100
Physical state: a
Analytical basic: EPA’s RMP*Comp(TM)
Scenario: Not reported
Quantity released in pounds: Not reported
Release duration in minutes: Not reported
Release rate in pounds per second: Not reported
Wind speed in meters/second: 3
Stability class: D
Topography: a
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported

SACRAMENTO RIVER WATER TREATMENT PLANT (Continued) **1011836452**

Environmental receptors: Not reported
Passive mitigation: Not reported
Active mitigation: Excess flow valve

RMP:
Percent weight of chemical: 100
Physical state: b
Analytical basic: EPA's RMP*Comp(TM)
Scenario: Not reported
Quantity released in pounds: Not reported
Release duration in minutes: 10
Release rate in pounds per second: Not reported
Wind speed in meters/second: 1.5
Stability class: F
Topography: a
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported

RMP:
Endpoint used: Not reported
LFL value: Not reported
Analytical basic: Not reported
Scenario: Not reported
Quantity released in pounds: Not reported
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported
Active mitigation: Not reported

RMP:
Analytical basic: Not reported
Quantity released in pounds: Not reported
Distance to endpoint in miles: Not reported
Residential population: Not reported
Public receptors: Not reported
Environmental receptors: Not reported
Passive mitigation: Not reported
Safety review date: Not reported
Most recent PHA date: Not reported
Process Hazard Analysis: Not reported
Expected PHA changes completion date: Not reported
Major Hazard: Not reported
Process Control: Not reported
Mitigation Systems: Not reported
Monitoring/Detection: Not reported
Changes since the last process hazard analysis: Not reported
Most recent review of op. procedures: Not reported
Most recent training progs review/update: Not reported
Training: Not reported
Competency testing: Not reported
Most recent maintenance review date: Not reported
Most recent equipment inspection date: Not reported
Equipment tested: Not reported
Most recent changes by mgmt: Not reported

SACRAMENTO RIVER WATER TREATMENT PLANT (Continued) **1011836452**

Date of most recent review/update:	Not reported
Date of pre-start review:	Not reported
Most recent compliance audit date:	Not reported
Expected date of audit completion:	Not reported
Most recent incident investigation:	Not reported
Expected date of investigation changes:	Not reported
Date of participation plan review:	Not reported
Date of hot work permit review:	Not reported
Date of contractor safety review:	Not reported
Date of contractor safety eval. review:	Not reported
Record has CBI data:	Not reported
Safety review date:	Not reported
Federal Regulation:	Not reported
Federal regulation comment:	Not reported
Major Hazard:	Not reported
Process Control:	Not reported
Mitigation Systems:	Not reported
Monitoring/Detection:	Not reported
Changes since the last process hazard analysis:	Not reported
Most recent hazard review/update:	Not reported
Most recent review of op. procedures:	Not reported
Most recent training progs review/update:	Not reported
Expected completion of review changes:	Not reported
Training:	Not reported
Competency testing:	Not reported
Most recent maintenance review date:	Not reported
Most recent equipment inspection date:	Not reported
Equipment tested:	Not reported
Most recent compliance audit date:	Not reported
Expected date of audit completion:	Not reported
Most recent incident investigation:	Not reported
Expected date of investigation changes:	Not reported
Record has CBI data:	Not reported
Date of most recent changes:	Not reported

RMP:

ER plan:	Not reported
ER plan most recent review date:	1998-08-15 00:00:00
ER plan most recent employee training date:	1998-12-15 00:00:00
Local agency coordinating ER plan:	Sacramento Fire Dept.
Telephone of the coordinating local agency:	9162645266
Federal regulation:	True
OSHA 1910 120:	True
SPCC:	False
RCRA:	False
OPA 90:	False
EPCRA:	False
Other Regulations:	Not reported

F37 **SACRAMENTO FILTRATION PLANT** **RCRA-SQG** **1000353484**
101 BERCUT **FINDS** **CAD981667637**
< 1/8 **SACRAMENTO, CA 95814**
1 ft.

Site 12 of 12 in cluster F

Relative:
Higher

Actual:
22 ft.

RCRA-SQG:

Date form received by agency:	09/01/1996
Facility name:	SACRAMENTO FILTRATION PLANT
Facility address:	101 BERCUT SACRAMENTO, CA 95814
EPA ID:	CAD981667637
Mailing address:	1023 J ST RM SECOND HUNDRED SE SACRAMENTO, CA 95814
Contact:	Not reported
Contact address:	Not reported Not reported
Contact country:	US
Contact telephone:	Not reported
Contact email:	Not reported
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	CITY OF SACRAMENTO
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Municipal
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	NOT REQUIRED
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Municipal
Owner/Operator Type:	Operator
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No

SACRAMENTO FILTRATION PLANT (Continued) **1000353484**

Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 10/17/1986
Site name: SACRAMENTO FILTRATION PLANT
Classification: Large Quantity Generator

Violation Status: No violations found

FINDS:

Registry ID: 110002743292

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

D38 **CA CHMIRS** **S100220687**
422 B STREET #2 **N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
1 ft.

Site 9 of 10 in cluster D

Relative: Higher

Actual: 22 ft.

CHMIRS:
OES Incident Number: 9013544
OES notification: Not reported
OES Date: Not reported
OES Time: Not reported
Incident Date: 19-OCT-90
Date Completed: 19-OCT-90
Property Use: 400
Agency Id Number: 57714
Agency Incident Number: 90-217
Time Notified: 30
Time Completed: 330
Surrounding Area: 400
Estimated Temperature: 68
Property Management: Not reported
More Than Two Substances Involved?: N
Resp Agncy Personel # Of Decontaminated: 0
Responding Agency Personel # Of Injuries: 0
Responding Agency Personel # Of Fatalities: 0
Others Number Of Decontaminated: 0
Others Number Of Injuries: 0
Others Number Of Fatalities: 0
Vehicle Make/year: Not reported
Vehicle License Number: Not reported

(Continued) **S100220687**

Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA DOT PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	WML PETE WHITE
Report Date:	19-OCT-90
Facility Telephone:	916 666-8646
Waterway Involved:	Not reported
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	Not reported
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	88-92
Agency:	Not reported
Incident Date:	Not reported
Admin Agency:	Not reported
Amount:	Not reported
Contained:	Not reported
Site Type:	Not reported
E Date:	13-JUN-91
Substance:	Not reported
Unknown:	Not reported
Substance #2:	Not reported
Substance #3:	Not reported
Evacuations:	Not reported
Number of Injuries:	Not reported
Number of Fatalities:	Not reported
#1 Pipeline:	Not reported
#2 Pipeline:	Not reported
#3 Pipeline:	Not reported
#1 Vessel >= 300 Tons:	Not reported
#2 Vessel >= 300 Tons:	Not reported
#3 Vessel >= 300 Tons:	Not reported
Evacs:	Not reported
Injuries:	Not reported
Fatals:	Not reported
Comments:	Y
Description:	Not reported

D39 **ERNS 90186258**

422 B. ST **N/A**

< 1/8 **WEST SACRAMENTO, CA 95691**

1 ft.

Site 10 of 10 in cluster D

Relative: Higher

Click this hyperlink while viewing on your computer to access additional ERNS detail in the EDR Site Report.

Actual: 22 ft.

G40 **CAPITOL PLATING - W SACRAMENTO** **CA UST** **U003850804**
319 3RD ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95605**
1 ft.

Site 1 of 13 in cluster G

Relative:
Higher

Actual:
27 ft.

YOLO CO. UST:

Facility Id:	FA0000081
Owner Id:	OW0000292
Owner Name:	STOCKTON PLATING INC
Owner Address:	PO BOX 6096
Owner City/State/Zip:	STOCKTON, CA 95206
Billing Name:	CAPITOL PLATING - W SACRAMENTO
Billing Address1:	4005 N WILSON WAY
Billing City/State/Zip:	STOCKTON, CA 95205
Contact Name:	Not reported
Contact Phone:	Not reported
Current Status:	Inactive, non-billable
Program Element:	2306 - UST PERMANENT CLOSURE PERMIT
Business Code:	09 - UNKNOWN
Business Type:	6 - OTHER
Tank Number:	1
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	5,000
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	01/01/92
INVGEN:	1992000081

G41 **319 3RD STREET** **US BROWNFIELDS** **1010735583**
319 3RD STREET **FINDS** **N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
1 ft.

Site 2 of 13 in cluster G

Relative:
Higher

Actual:
27 ft.

US BROWNFIELDS:

Recipient name:	West Sacramento, City of
Grant type:	Assessment
Property name:	319 3RD STREET
Property #:	010-371-03
Parcel size:	.4
Property Description:	The property is a former metal plating facility that has been identified as a seriously contaminated property. The plating shop operated at the property from at least the 1950s until 1986 when a fire destroyed on the buildings at the site. Site investigations conducted at and around the site between 1997 and 2008 revealed highly elevated levels of heavy metal contamination including chromium, nickel and lead.
Latitude:	38.587835
Longitude:	-121.509752
HCM label:	Not reported
Map scale:	Not reported
Point of reference:	Not reported
Datum:	World Geodetic System of 1984
ACRES property ID:	94182
Start date:	Not reported

319 3RD STREET (Continued) **1010735583**

Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	4200
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	EPA
Cleanup funding entity:	Not reported
Grant type:	N/A
Accomplishment type:	Phase I Environmental Assessment
Accomplishment count:	1
Cooperative agreement #:	96950001
Ownership entity:	Government
Current owner:	City of West Sacramento
Did owner change:	N
Cleanup required:	Yes
Video available:	No
Photo available:	Yes
Institutional controls required:	Not reported
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	Not reported
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Y
Groundwater cleaned:	Not reported
Lead contaminant found:	Y
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Y
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Not reported
Petro products cleaned:	Not reported

319 3RD STREET (Continued) **1010735583**

Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Y
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	Not reported
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported
Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported
Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported

FINDS:

Registry ID: 110033618459

Environmental Interest/Information System
California Department of Toxic Substances Control EnviroStor System

319 3RD STREET (Continued) **1010735583**

(DTSC-EnviroStor) is an online search and Geographic Information System (GIS) tool for identifying sites that have known contamination or sites for which there may be reasons to investigate further. The EnviroStor database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites.

US EPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) is an federal online database for Brownfields Grantees to electronically submit data directly to EPA.

Registry ID: 110039059862

Environmental Interest/Information System
US EPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) is an federal online database for Brownfields Grantees to electronically submit data directly to EPA.

G42 **FOSTER CHAS** **EDR US Hist Auto Stat** **1009021266**
319 3RD ST **N/A**
< 1/8 **BRODERICK, CA**
1 ft.

Site 3 of 13 in cluster G

Relative: EDR Historical Auto Stations:
Higher Name: FOSTER CHAS
Year: 1947
Actual: Type: AUTOMOBILE REPAIRING
27 ft.

G43 **AVANCED GIO ENVIRONMENTAL** **CA HAZNET** **S113103693**
319 3RD ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95605**
1 ft.

Site 4 of 13 in cluster G

Relative: HAZNET:
Higher

envid:	S113103693
Year:	2002
GEPAID:	CAL000203183
Contact:	PAUL DOTSON
Telephone:	2094671006
Mailing Name:	Not reported
Mailing Address:	837 SHAW ST
Mailing City,St,Zip:	STOCKTON, CA 952150000
Gen County:	Not reported
TSD EPA ID:	CAT080014079
TSD County:	Not reported
Waste Category:	Other inorganic solid waste
Disposal Method:	Transfer Station
Tons:	1.5
Facility County:	Yolo

Actual:
27 ft.

envid:	S113103693
Year:	2002

AVANCED GIO ENVIRONMENTAL (Continued) **S113103693**

GEPAID:	CAL000203183
Contact:	PAUL DOTSON
Telephone:	2094671006
Mailing Name:	Not reported
Mailing Address:	837 SHAW ST
Mailing City,St,Zip:	STOCKTON, CA 952150000
Gen County:	Not reported
TSD EPA ID:	CAL000190816
TSD County:	Not reported
Waste Category:	Waste oil and mixed oil
Disposal Method:	Transfer Station
Tons:	0.22
Facility County:	Yolo

G44 **CAPITOL PLATING CORPORATION** **CA Cortese** **U001612322**
319 3RD STREET **CA SLIC** **N/A**
< 1/8 **WEST SACRAMENTO, CA 95605** **CA HIST UST**
1 ft. **CA RESPONSE**
Site 5 of 13 in cluster G **CA ENVIROSTOR**

Relative: Higher

Actual: 27 ft.

CORTESE:

Region:	CORTESE
Envirostor Id:	57340006
Site/Facility Type:	STATE RESPONSE
Cleanup Status:	BACKLOG
Status Date:	10/04/2013
Site Code:	100327
Latitude:	38.587835
Longitude:	-121.50975
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	envirostor
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported

SLIC:

Region:	STATE
Facility Status:	**Open - Inactive**
Status Date:	12/02/1999
Global Id:	SL0611399897
Lead Agency:	DEPARTMENT OF TOXIC SUBSTANCES CONTROL
Lead Agency Case Number:	57340006
Latitude:	38.5877761330395
Longitude:	-121.509829759598
Case Type:	Cleanup Program Site
Case Worker:	Not reported
Local Agency:	Not reported
RB Case Number:	SLT5S815
File Location:	DTSC
Potential Media Affected:	Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	Not reported

CAPITOL PLATING CORPORATION (Continued) **U001612322**

Site History: Not reported

Click here to access the California GeoTracker records for this facility:

HIST UST:

Region:	STATE
Facility ID:	00000013691
Facility Type:	Other
Other Type:	PLATING COMPANY
Contact Name:	BILL BURNLEY
Telephone:	9163723300
Owner Name:	STOCKTON PLATING, INC.
Owner Address:	632 SO. EL DORADO STREET
Owner City,St,Zip:	STOCKTON, CA 95206
Total Tanks:	0001
Tank Num:	001
Container Num:	#8
Year Installed:	Not reported
Tank Capacity:	00005000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	Not reported
Leak Detection:	Visual

RESPONSE:

Facility ID:	57340006
Site Type:	State Response
Site Type Detail:	State Response or NPL
Acres:	0.06
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Not reported
Supervisor:	William Beckman
Division Branch:	Cleanup Sacramento
Site Code:	100327
Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	07
Senate:	06
Special Program Status:	EPA - Target Site Investigation
Status:	Backlog
Status Date:	10/04/2013
Restricted Use:	NO
Funding:	* Unknown
Latitude:	38.58783
Longitude:	-121.5097
APN:	010 371 03, 010-371-03
Past Use:	METAL PLATING - CHROME, METAL PLATING - OTHER
Potential COC :	Chromium VI 1,2-Dichloroethane (EDC Nickel
Confirmed COC:	Chromium VI 1,2-Dichloroethane (EDC Nickel
Potential Description:	AQUI, SV, IA
Alias Name:	STOCKTON PLATING INC (DBA CAPITOL PLT)
Alias Type:	Alternate Name
Alias Name:	010 371 03
Alias Type:	APN

CAPITOL PLATING CORPORATION (Continued) **U001612322**

Alias Name: 010-371-03
Alias Type: APN
Alias Name: 110033618459
Alias Type: EPA (FRS #)
Alias Name: SL0611399897
Alias Type: GeoTracker Global ID
Alias Name: CAD065002180
Alias Type: HWTS Identification Code
Alias Name: 100327
Alias Type: Project Code (Site Code)
Alias Name: 57340006
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Report
Completed Date: 12/23/2004
Comments: Site Summary Investigation Report summerized existing data and new data from 2004 CPT and groundwater wells.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Information Request Letter
Completed Date: 02/28/2007
Comments: Request sent on 2/28/07.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 08/03/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 03/06/1992
Comments: Expedited Response Action completed. Stockton Plating , Inc. (parent company) and the current property owners worked cooperatively to secure the site with a fence and post warning signs.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 08/26/1991
Comments: Recommend medium priority PEA. Contact owners to secure site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 02/03/1987
Comments: SITE SCREENING DONE. THE ENFORCEMENT UNIT IS WORKING ON MITIGATION IN RESPONSE TO NOV OF 7/14/86.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported

CAPITOL PLATING CORPORATION (Continued) **U001612322**

Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

ENVIROSTOR:
Facility ID: 57340006
Status: Backlog
Status Date: 10/04/2013
Site Code: 100327
Site Type: State Response
Site Type Detailed: State Response or NPL
Acres: 0.06
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Not reported
Supervisor: William Beckman
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: EPA - Target Site Investigation
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: * Unknown
Latitude: 38.58783
Longitude: -121.5097
APN: 010 371 03, 010-371-03
Past Use: METAL PLATING - CHROME, METAL PLATING - OTHER
Potential COC: Chromium VI 1,2-Dichloroethane (EDC Nickel
Confirmed COC: Chromium VI 1,2-Dichloroethane (EDC Nickel
Potential Description: AQUI, SV, IA
Alias Name: STOCKTON PLATING INC (DBA CAPITOL PLT)
Alias Type: Alternate Name
Alias Name: 010 371 03
Alias Type: APN
Alias Name: 010-371-03
Alias Type: APN
Alias Name: 110033618459
Alias Type: EPA (FRS #)
Alias Name: SL0611399897
Alias Type: GeoTracker Global ID
Alias Name: CAD065002180
Alias Type: HWTS Identification Code
Alias Name: 100327
Alias Type: Project Code (Site Code)
Alias Name: 57340006
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Report
Completed Date: 12/23/2004
Comments: Site Summary Investigation Report summerized existing data and new data from 2004 CPT and groundwater wells.

CAPITOL PLATING CORPORATION (Continued) **U001612322**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Information Request Letter
Completed Date: 02/28/2007
Comments: Request sent on 2/28/07.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 08/03/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 03/06/1992
Comments: Expedited Response Action completed. Stockton Plating , Inc. (parent company) and the current property owners worked cooperatively to secure the site with a fence and post warning signs.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 08/26/1991
Comments: Recommend medium priority PEA. Contact owners to secure site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 02/03/1987
Comments: SITE SCREENING DONE. THE ENFORCEMENT UNIT IS WORKING ON MITIGATION IN RESPONSE TO NOV OF 7/14/86.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

G45 **WASHINGTON FIREHOUSE** **US BROWNFIELDS 1016340783**
317 3RD STREET **FINDS N/A**
< 1/8 **WEST SACRAMENTO, CA 95605**
1 ft.

Site 6 of 13 in cluster G

Relative: Higher

Actual: 23 ft.

US BROWNFIELDS:
Recipient name: West Sacramento, City of
Grant type: Assessment
Property name: WASHINGTON FIREHOUSE
Property #: 010-371-04, 010-371-05, & 010-371-06
Parcel size: .59
Property Description: The property is a former fire station and police station that served the town of Washington dating back to the 1940s. A UST was removed from the property in 1987, although there is no evidence of a

WASHINGTON FIREHOUSE (Continued) **1016340783**

	confirmed leak from the tank. The property, owned by the City, is adjacent to a former plating shop that has been identified as a seriously contaminated property.
Latitude:	38.58806
Longitude:	-121.509849
HCM label:	Address Matching-House Number
Map scale:	1:24000
Point of reference:	Entrance Point of a Facility or Station
Datum:	World Geodetic System of 1984
ACRES property ID:	11213
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	3303
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	EPA
Cleanup funding entity:	Not reported
Grant type:	H
Accomplishment type:	Phase I Environmental Assessment
Accomplishment count:	1
Cooperative agreement #:	96950001
Ownership entity:	Government
Current owner:	City of West Sacramento
Did owner change:	N
Cleanup required:	Yes
Video available:	No
Photo available:	Yes
Institutional controls required:	U
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	Not reported
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Y
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Y

WASHINGTON FIREHOUSE (Continued) **1016340783**

Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Not reported
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Not reported
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	Not reported
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported
Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported
Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported

WASHINGTON FIREHOUSE (Continued) **1016340783**

Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported
Recipient name:	R9 Brownfields TBA (previously Superfund TBA)
Grant type:	TBA
Property name:	WASHINGTON FIREHOUSE
Property #:	010-371-04, 010-371-05, & 010-371-06
Parcel size:	.59
Property Description:	The property is a former fire station and police station that served the town of Washington dating back to the 1940s. A UST was removed from the property in 1987, although there is no evidence of a confirmed leak from the tank. The property, owned by the City, is adjacent to a former plating shop that has been identified as a seriously contaminated property.
Latitude:	38.58806
Longitude:	-121.509849
HCM label:	Address Matching-House Number
Map scale:	1:24000
Point of reference:	Entrance Point of a Facility or Station
Datum:	World Geodetic System of 1984
ACRES property ID:	11213
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	7240
Assessment funding source:	US EPA - TBA Funding
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	EPA
Cleanup funding entity:	Not reported
Grant type:	H
Accomplishment type:	Phase I Environmental Assessment
Accomplishment count:	0
Cooperative agreement #:	n/a
Ownership entity:	Government
Current owner:	City of West Sacramento
Did owner change:	N
Cleanup required:	Yes
Video available:	No
Photo available:	Yes
Institutional controls required:	U
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	Not reported
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported

WASHINGTON FIREHOUSE (Continued) **1016340783**

Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Y
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Y
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Not reported
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Not reported
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	Not reported
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported
Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported

WASHINGTON FIREHOUSE (Continued) **1016340783**

Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported
Recipient name:	R9 Brownfields TBA (previously Superfund TBA)
Grant type:	TBA
Property name:	WASHINGTON FIREHOUSE
Property #:	010-371-04, 010-371-05, & 010-371-06
Parcel size:	.59
Property Description:	The property is a former fire station and police station that served the town of Washington dating back to the 1940s. A UST was removed from the property in 1987, although there is no evidence of a confirmed leak from the tank. The property, owned by the City, is adjacent to a former plating shop that has been identified as a seriously contaminated property.
Latitude:	38.58806
Longitude:	-121.509849
HCM label:	Address Matching-House Number
Map scale:	1:24000
Point of reference:	Entrance Point of a Facility or Station
Datum:	World Geodetic System of 1984
ACRES property ID:	11213
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	60000
Assessment funding source:	US EPA - TBA Funding
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	EPA
Cleanup funding entity:	Not reported
Grant type:	H
Accomplishment type:	Phase II Environmental Assessment
Accomplishment count:	0
Cooperative agreement #:	n/a
Ownership entity:	Government
Current owner:	City of West Sacramento
Did owner change:	N
Cleanup required:	Yes

WASHINGTON FIREHOUSE (Continued) **1016340783**

Video available:	No
Photo available:	Yes
Institutional controls required:	U
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	Not reported
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Y
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Y
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Not reported
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Not reported
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	Not reported
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported
Arsenic cleaned up:	Not reported

WASHINGTON FIREHOUSE (Continued) **1016340783**

Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported
Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported

FINDS:

Registry ID: 110030886209

Environmental Interest/Information System
US EPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) is an federal online database for Brownfields Grantees to electronically submit data directly to EPA.

C46 **CITY OF WEST SACRAMENTO/OLD POLICE BLDG** **CA HAZNET** **S112885735**
305 3RD ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
1 ft.

Site 2 of 8 in cluster C

Relative: Higher

Actual: 22 ft.

HAZNET:

envid:	S112885735
Year:	1997
GEPAID:	CAC001370936
Contact:	CITY OF WEST SACRAMENTO
Telephone:	9163735850
Mailing Name:	Not reported
Mailing Address:	1951 S RIVER RD
Mailing City,St,Zip:	WEST SACRAMENTO, CA 956910000
Gen County:	Not reported

CITY OF WEST SACRAMENTO/OLD POLICE BLDG (Continued) **S112885735**

TSD EPA ID: CAT080014079
TSD County: Not reported
Waste Category: Other organic solids
Disposal Method: Not reported
Tons: .0750
Facility County: Yolo

G47 **FIREHOUSE BLOCK SITE B** **US BROWNFIELDS 1015877881**
325 3RD STREET **FINDS N/A**
< 1/8 **WEST SACRAMENTO, CA 95605**
1 ft.

Site 7 of 13 in cluster G

Relative: Higher

Actual: 31 ft.

US BROWNFIELDS:

Recipient name:	California Department of Toxic Substances Control
Grant type:	Assessment
Property name:	FIREHOUSE BLOCK SITE B
Property #:	010-371-02
Parcel size:	.5
Property Description:	Property contains one metal shed-type building previously used for storage, generally apparently in conjunction with adjacent commercial property. Some trees & shrubs on property. Gravel access driveway still in place. Property fenced & gated. Various past private owners, currently private owner.
Latitude:	38.587616
Longitude:	-121.50977899999998
HCM label:	Address Matching-House Number
Map scale:	Not reported
Point of reference:	Entrance Point of a Facility or Station
Datum:	North American Datum of 1983
ACRES property ID:	141561
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	7000
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	EPA
Cleanup funding entity:	Not reported
Grant type:	H
Accomplishment type:	Phase II Environmental Assessment
Accomplishment count:	1
Cooperative agreement #:	96950201
Ownership entity:	Private
Current owner:	Not reported
Did owner change:	N
Cleanup required:	No
Video available:	No
Photo available:	No
Institutional controls required:	N
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported

FIREHOUSE BLOCK SITE B (Continued) **1015877881**

IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	No
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Y
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Y
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Y
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Y
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	.5
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	.5
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported
Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported

FIREHOUSE BLOCK SITE B (Continued) **1015877881**

No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported
Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported

FINDS:

Registry ID: 110045401301

Environmental Interest/Information System
US EPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) is an federal online database for Brownfields Grantees to electronically submit data directly to EPA.

G48 **THRIFTY CLEANERS** **EDR US Hist Cleaners** **1009145399**
322 3RD ST **N/A**
< 1/8 **BRODERICK, CA**
1 ft.

Site 8 of 13 in cluster G

Relative: Higher

Actual: 30 ft.

EDR Historical Cleaners:

Name:	DECITIS JULIUS
Year:	1947
Type:	CLOTHES PRESSERS AND CLEANERS
Name:	DECETIS JULIUS
Year:	1952
Type:	CLEANERS AND DYERS
Name:	THRIFTY CLEANERS
Year:	1957
Type:	CLOTHES PRESSERS AND CLEANERS

G49 **STOCKTON PLAT. INC DBA CAPITOL PLT. CO** **RCRA-SQG** **1000173668**
319 3RD ST **FINDS** **CAD065002180**
< 1/8 **BRODERICK, CA 95605**
1 ft.

Site 9 of 13 in cluster G

Relative:
Higher

Actual:
27 ft.

RCRA-SQG:

Date form received by agency:	09/01/1996
Facility name:	STOCKTON PLAT. INC DBA CAPITOL PLT. CO
Facility address:	319 3RD ST BRODERICK, CA 95605
EPA ID:	CAD065002180
Mailing address:	THIRD ST BRODERICK, CA 95605
Contact:	Not reported
Contact address:	Not reported Not reported
Contact country:	US
Contact telephone:	Not reported
Contact email:	Not reported
EPA Region:	09
Land type:	Facility is not located on Indian land. Additional information is not known.
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	SMITH, NICK J
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	NOT REQUIRED
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No

STOCKTON PLAT. INC DBA CAPITOL PLT. CO (Continued) **1000173668**

Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Violation Status: No violations found

Evaluation Action Summary:

Evaluation date:	05/02/1986
Evaluation:	FOCUSED COMPLIANCE INSPECTION
Area of violation:	Not reported
Date achieved compliance:	Not reported
Evaluation lead agency:	State

FINDS:

Registry ID: 110002654413

Environmental Interest/Information System

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

H50 **CA CHMIRS** **S109037068**
2 ND & D STREET **N/A**
< 1/8 **WEST SACRAMENTO, CA**
1 ft.

Site 1 of 4 in cluster H

Relative: Higher

Actual: 34 ft.

CHMIRS:

OES Incident Number:	06-4318
OES notification:	07/21/2006
OES Date:	Not reported
OES Time:	Not reported
Incident Date:	Not reported
Date Completed:	**Not reported**
Property Use:	Not reported
Agency Id Number:	Not reported
Agency Incident Number:	Not reported
Time Notified:	Not reported
Time Completed:	Not reported
Surrounding Area:	Not reported
Estimated Temperature:	Not reported
Property Management:	Not reported
More Than Two Substances Involved?:	Not reported
Resp Agncy Personel # Of Decontaminated:	Not reported
Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported

(Continued) **S109037068**

Others Number Of Fatalities:	Not reported
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA DOT PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	Not reported
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	Reporting Party
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	2006
Agency:	UPRR
Incident Date:	7/21/2006 12:00:00 AM
Admin Agency:	Yolo County Office of Emergency Services
Amount:	Not reported
Contained:	Yes
Site Type:	Rail Road
E Date:	Not reported
Substance:	Train V Trespasser
Gallons:	0.000000
Unknown:	0
Substance #2:	Not reported
Substance #3:	Not reported
Evacuations:	0
Number of Injuries:	0
Number of Fatalities:	0
#1 Pipeline:	Not reported
#2 Pipeline:	Not reported
#3 Pipeline:	Not reported
#1 Vessel >= 300 Tons:	Not reported
#2 Vessel >= 300 Tons:	Not reported
#3 Vessel >= 300 Tons:	Not reported
Evacs:	Not reported
Injuries:	Not reported
Fatals:	Not reported
Comments:	Not reported
Description:	Caller advised that a trespasser ran into the train and then fled.

H51 **BRYSON DOUGLAS** **EDR US Hist Cleaners** **1009146404**
211 D ST **N/A**
< 1/8 **BRODERICK, CA**
1 ft.

Site 2 of 4 in cluster H

Relative: EDR Historical Cleaners:
Higher
Name: BRYSON DOUGLAS
Year: 1942
Actual: Type: CLOTHES PRESSERS AND CLEANERS
35 ft.

H52 **SING LEE** **EDR US Hist Cleaners** **1009145783**
424 2ND ST **N/A**
< 1/8 **BRODERICK, CA**
1 ft.

Site 3 of 4 in cluster H

Relative: EDR Historical Cleaners:
Higher
Name: SING LEE
Year: 1923
Actual: Type: LAUNDRIES
34 ft.

Name: SING LEE
Year: 1923
Type: LAUNDRIES

Name: LEE SING
Year: 1928
Type: LAUNDRIES-CHINESE

Name: LEE SING
Year: 1928
Type: LAUNDRIES-CHINESE

Name: SING LEE
Year: 1937
Type: LAUNDRIES-CHINESE

Name: SING LEE
Year: 1942
Type: LAUNDRIES-ORIENTAL

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53 **C & J LAUNDROMAT** **EDR US Hist Cleaners** **1009145588**
423 3RD ST **N/A**
< 1/8 **BRODERICK, CA**
1 ft.

EDR Historical Cleaners:
Relative:
Higher
Name: SPEED-WASH LAUNDRY
Year: 1961
Type: LAUNDRIES-SELF SERVE
Actual:
29 ft.

Name: JACK S SPEED-WASH LAUNDRY
Year: 1966
Type: LAUNDRIES-SELF SERVE

Name: JACK S SPEED-WASH LAUNDRY
Year: 1970

C & J LAUNDROMAT (Continued) **1009145588**

Type: LAUNDRIES-SELF SERVE

Name: C & J LAUNDROMAT
Year: 1982
Type: LAUNDRIES-SELF SERVE

G54 **CA CHMIRS** **S105885512**
N/A

3RD AND D STREET
< 1/8 **WEST SACRAMENTO, CA**
1 ft.

Site 10 of 13 in cluster G

Relative: CHMIRS:
Higher

OES Incident Number:	02-4206	
OES notification:	08/03/2002	
Actual: OES Date:	Not reported	
33 ft. OES Time:	Not reported	
Incident Date:	Not reported	
Date Completed:	**Not reported**	
Property Use:	Not reported	
Agency Id Number:	Not reported	
Agency Incident Number:	Not reported	
Time Notified:	Not reported	
Time Completed:	Not reported	
Surrounding Area:	Not reported	
Estimated Temperature:	Not reported	
Property Management:	Not reported	
More Than Two Substances Involved?:		Not reported
Resp Agncy Personel # Of Decontaminated:		Not reported
Responding Agency Personel # Of Injuries:		Not reported
Responding Agency Personel # Of Fatalities:		Not reported
Others Number Of Decontaminated:		Not reported
Others Number Of Injuries:		Not reported
Others Number Of Fatalities:		Not reported
Vehicle Make/year:	Not reported	
Vehicle License Number:	Not reported	
Vehicle State:	Not reported	
Vehicle Id Number:	Not reported	
CA DOT PUC/ICC Number:	Not reported	
Company Name:	Not reported	
Reporting Officer Name/ID:	Not reported	
Report Date:	Not reported	
Facility Telephone:	Not reported	
Waterway Involved:	No	
Waterway:	Not reported	
Spill Site:	Not reported	
Cleanup By:	N/A	
Containment:	Not reported	
What Happened:	Not reported	
Type:	Not reported	
Measure:	Not reported	
Other:	Not reported	
Date/Time:	Not reported	
Year:	2002	
Agency:	UPRR	
Incident Date:	8/3/200212:00:00 AM	
Admin Agency:	Yolo County Office of Emergency Services	
Amount:	Not reported	

(Continued) **S105885512**

Contained:	Yes
Site Type:	Rail Road
E Date:	Not reported
Substance:	Amtrac v Trespasser
Gallons:	0.000000
Unknown:	0
Substance #2:	Not reported
Substance #3:	Not reported
Evacuations:	0
Number of Injuries:	1
Number of Fatalities:	0
#1 Pipeline:	Not reported
#2 Pipeline:	Not reported
#3 Pipeline:	Not reported
#1 Vessel >= 300 Tons:	Not reported
#2 Vessel >= 300 Tons:	Not reported
#3 Vessel >= 300 Tons:	Not reported
Evacs:	Not reported
Injuries:	Not reported
Fatals:	Not reported
Comments:	Not reported
Description:	Amtrack train struck trespasser on the tracks.

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55 **SING LEE** **EDR US Hist Cleaners** **1009148104**
424 2D ST **N/A**
< 1/8 **BRODERICK, CA**
1 ft.

Relative: Higher

Actual: 28 ft.

EDR Historical Cleaners:

Name:	SING LEE
Year:	1933
Type:	LAUNDRIES CHINESE

G56 **CAPITOL PLATING** **US BROWNFIELDS** **1010340801**
319 3RD STREET **N/A**
< 1/8 **WEST SACRAMENTO, CA 95606**
1 ft.

Site 11 of 13 in cluster G

Relative: Higher

Actual: 27 ft.

US BROWNFIELDS:

Recipient name:	California Dept of Toxic Substance Control
Grant type:	Section 128(a) State/Tribal
Property name:	CAPITOL PLATING
Property #:	010-371-03
Parcel size:	.29
Property Description:	From 1949 until 1985 the property has been occupied by various metal-plating facilities. The surrounding area consists of both commercial and residential structures. Prior to operation as a plating facility, the property reportedly had been used as an automobile repair facility.
Latitude:	38.58883
Longitude:	-121.5108
HCM label:	Address Matching-House Number
Map scale:	1:24000
Point of reference:	Entrance Point of a Facility or Station
Datum:	World Geodetic System of 1984

CAPITOL PLATING (Continued) **1010340801**

ACRES property ID:	52141
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	140000
Assessment funding source:	US EPA - State & Tribal Section 128(a) Funding
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	Not reported
Cleanup funding entity:	Not reported
Grant type:	N/A
Accomplishment type:	Phase II Environmental Assessment
Accomplishment count:	1
Cooperative agreement #:	97963101
Ownership entity:	Private
Current owner:	Judy & Lin Guess
Did owner change:	N
Cleanup required:	Yes
Video available:	Not reported
Photo available:	Yes
Institutional controls required:	Not reported
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	Unknown
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Y
Groundwater cleaned:	Not reported
Lead contaminant found:	Y
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Y
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported

CAPITOL PLATING (Continued) **1010340801**

Petro products found:	Not reported
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Y
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
VOCs found:	Y
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	Not reported
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported
Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported
Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported

G57 **CITY OF WEST SACRAMENTO** **CA HAZNET** **S112992501**
320 2ND ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95605**
1 ft.

Site 12 of 13 in cluster G

Relative: HAZNET:
Higher

envid:	S112992501
Year:	2011
Actual: GEPAID:	CAC002674749
26 ft. Contact:	AARON LAUREL
Telephone:	9166174555
Mailing Name:	Not reported
Mailing Address:	1110 W CAPITOL AVE
Mailing City,St,Zip:	WEST SACRAMENTO, CA 956912717
Gen County:	Not reported
TSD EPA ID:	CAD044003556
TSD County:	Not reported
Waste Category:	Unspecified oil-containing waste
Disposal Method:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons:	0.1251
Facility County:	Yolo

G58 **FIREHOUSE BLOCK SITE A** **US BROWNFIELDS** **1015877880**
320 2ND STREET **FINDS** **N/A**
< 1/8 **WEST SACRAMENTO, CA 95605**
1 ft.

Site 13 of 13 in cluster G

Relative: US BROWNFIELDS:
Higher

Recipient name:	California Department of Toxic Substances Control
Grant type:	Assessment
Actual: Property name:	FIREHOUSE BLOCK SITE A
26 ft. Property #:	01-371-07, 01-371-08, 010-371-09
Parcel size:	2.5
Property Description:	Property now vacant with concrete pads remaining in place from prior residential use. Some shrubs & trees still remain. Property initially developed in late 1890s & early 1900s for residential use. Property bisected by an overhead freeway/bridge access structure which was reason for removal of residences. Property held in private family trust. Very limited use of less than 0.25 acres as a parking lot for adjacent Firehouse property when used as a police substation - asphalt remains in place.
Latitude:	38.587655
Longitude:	-121.50929100000002
HCM label:	Address Matching-House Number
Map scale:	Not reported
Point of reference:	Entrance Point of a Facility or Station
Datum:	North American Datum of 1983
ACRES property ID:	141541
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	25000
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported

FIREHOUSE BLOCK SITE A (Continued) **1015877880**

Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	EPA
Cleanup funding entity:	Not reported
Grant type:	H
Accomplishment type:	Phase II Environmental Assessment
Accomplishment count:	1
Cooperative agreement #:	96950201
Ownership entity:	Private
Current owner:	Private family trust
Did owner change:	N
Cleanup required:	Yes
Video available:	No
Photo available:	No
Institutional controls required:	N
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	No
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Y
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Y
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Y
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported

FIREHOUSE BLOCK SITE A (Continued) **1015877880**

Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	2.5
Past use commercial acreage:	Not reported
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported
Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported
Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported

FINDS:

Registry ID: 110045401294

Environmental Interest/Information System
US EPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) is an federal online database for Brownfields Grantees to electronically submit data directly to EPA.

C59 **E & B AUTO SALES** **EDR US Hist Auto Stat** **1009022747**
301 C STREET **N/A**
< 1/8 **BRODERICK, CA**
1 ft.

Site 3 of 8 in cluster C

Relative: EDR Historical Auto Stations:
Higher
Name: STEVENS SERVICE
Year: 1966
Actual: Type: GASOLINE STATIONS
22 ft.

Name: E & B AUTO SALES
Year: 1975
Type: AUTOMOBILE DEALERS

E60 **GARY'S SERVICE CASE #1** **CA RGA LUST** **S114625748**
427 C ST **N/A**
< 1/8 **WEST SACRAMENTO, CA**
1 ft.

Site 3 of 15 in cluster E

Relative: RGA LUST:
Higher

2012	GARY'S SERVICE CASE #1	427 C ST
2011	GARY'S SERVICE CASE #1	427 C ST
2010	GARY'S SERVICE CASE #1	427 C ST
2009	GARY'S SERVICE CASE #1	427 C ST
2008	GARY'S SERVICE CASE #1	427 C ST
2007	GARY'S SERVICE CASE #1	427 C ST
2006	GARY'S SERVICE CASE #1	427 C ST
2005	GARY'S SERVICE CASE #1	427 C ST

Actual:
24 ft.

E61 **GARY'S SERVICE** **CA UST** **U004003672**
427 C ST **N/A**
< 1/8 **BRODERICK, CA 95605**
1 ft.

Site 4 of 15 in cluster E

Relative: YOLO CO. UST:
Higher

Facility Id:	FA0000178
Owner Id:	OW0000191
Actual: Owner Name:	CAGLE LEON
24 ft. Owner Address:	1436 DOBROS DR
Owner City/State/Zip:	BRYTE, CA 95605
Billing Name:	Not reported
Billing Address1:	Not reported
Billing City/State/Zip:	Not reported
Contact Name:	Not reported
Contact Phone:	Not reported
Current Status:	Inactive, non-billable
Program Element:	2306 - UST PERMANENT CLOSURE PERMIT
Business Code:	09 - UNKNOWN
Business Type:	6 - OTHER
Tank Number:	1
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	1,000

GARY'S SERVICE (Continued) **U004003672**

Product Type: Regular Unleaded
Leak Detection Number: Not reported
LEA Id: Not reported
Surcharge Year: 01/01/92
INVGEN: 1992000178

Tank Number: 2
Tank Status: Inactive
Tank Type: Petroleum
Tank Description: DOUBLE-WALL
Tank Capacity: 1,000
Product Type: Regular Unleaded
Leak Detection Number: Not reported
LEA Id: Not reported
Surcharge Year: 01/01/92
INVGEN: 1992000178

Tank Number: 3
Tank Status: Inactive
Tank Type: Petroleum
Tank Description: DOUBLE-WALL
Tank Capacity: 1,000
Product Type: Regular Unleaded
Leak Detection Number: Not reported
LEA Id: Not reported
Surcharge Year: 01/01/92
INVGEN: 1992000178

E62 **GARY'S MOWHAWK SERVICE CASE #2** **CA RGA LUST** **S114625746**
427 C STREET **N/A**
< 1/8 **WEST SACRAMENTO, CA**
1 ft.

Site 5 of 15 in cluster E

Relative: RGA LUST:
Higher

2012	GARY'S MOWHAWK SERVICE CASE #2	427 C STREET
2011	GARY'S MOWHAWK SERVICE CASE #2	427 C STREET
2010	GARY'S MOWHAWK SERVICE CASE #2	427 C STREET
2009	GARY'S MOWHAWK SERVICE CASE #2	427 C STREET
2008	GARY'S MOWHAWK SERVICE CASE #2	427 C STREET
2007	GARY'S MOWHAWK SERVICE CASE #2	427 C STREET
2006	GARY'S MOWHAWK SERVICE CASE #2	427 C STREET
2005	GARY'S MOWHAWK SERVICE CASE #2	427 C STREET

Actual:
24 ft.

E63 **GARY'S MOWHAWK SERVICE CASE #2** **CA HIST CORTESE** **S101306161**
427 C STREET **CA LUST** **N/A**
< 1/8 **WEST SACRAMENTO, CA 95605**
1 ft.

Site 6 of 15 in cluster E

Relative: HIST CORTESE:
Higher
Region: CORTESE
Facility County Code: 57
Reg By: LTNKA
Reg Id: 570118

Actual:
24 ft.

GARY'S MOWHAWK SERVICE CASE #2 (Continued) **S101306161**

LUST:

Region:	STATE
Global Id:	T0611338487
Latitude:	38.5885225038859
Longitude:	-121.512404680252
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	08/24/2012
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	DFS
Local Agency:	YOLO COUNTY
RB Case Number:	570326
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	Gasoline, Diesel
Site History:	The case was opened following an unauthorized release from an underground storage tank system at the subject site. Corrective action is underway as directed by the CVRWQCB. Corrective action may consist of preliminary site investigation, planning and implementation of remedial action, verification monitoring, or a combination thereof. A summary of the site history is available by clicking on either the "Cleanup Status History", "Regulatory Activities" or the "Site Maps/Documents" tab. For a complete site history the case file at the CVRWQCB should be consulted.

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0611338487
Contact Type:	Local Agency Caseworker
Contact Name:	MARY LE
Organization Name:	YOLO COUNTY
Address:	10 COTTONWOOD STREET
City:	WOODLAND
Email:	Not reported
Phone Number:	Not reported

Global Id:	T0611338487
Contact Type:	Regional Board Caseworker
Contact Name:	DAVID STAVAREK
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	dstavarek@waterboards.ca.gov
Phone Number:	Not reported

Status History:

Global Id:	T0611338487
Status:	Completed - Case Closed
Status Date:	08/24/2012

Global Id:	T0611338487
Status:	Open - Case Begin Date
Status Date:	12/16/2003

Global Id:	T0611338487

GARY'S MOWHAWK SERVICE CASE #2 (Continued) **S101306161**

Status: Open - Remediation
Status Date: 07/03/2012

Global Id: T0611338487
Status: Open - Site Assessment
Status Date: 03/25/2004

Regulatory Activities:
Global Id: T0611338487
Action Type: ENFORCEMENT
Date: 03/12/2010
Action: Technical Correspondence / Assistance / Other

Global Id: T0611338487
Action Type: Other
Date: 01/01/1989
Action: Leak Began

Global Id: T0611338487
Action Type: ENFORCEMENT
Date: 11/17/2004
Action: File review

Global Id: T0611338487
Action Type: ENFORCEMENT
Date: 10/22/2004
Action: Staff Letter

Global Id: T0611338487
Action Type: RESPONSE
Date: 09/15/2010
Action: Correspondence

Global Id: T0611338487
Action Type: RESPONSE
Date: 10/01/2010
Action: Other Report / Document

Global Id: T0611338487
Action Type: RESPONSE
Date: 11/15/2010
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 07/31/2010
Action: Monitoring Report - Quarterly

Global Id: T0611338487
Action Type: RESPONSE
Date: 04/30/2010
Action: Monitoring Report - Quarterly

Global Id: T0611338487
Action Type: RESPONSE
Date: 02/07/2011
Action: Verbal Communication

GARY'S MOWHAWK SERVICE CASE #2 (Continued) **S101306161**

Global Id: T0611338487
Action Type: REMEDIATION
Date: 04/15/1990
Action: Excavation

Global Id: T0611338487
Action Type: ENFORCEMENT
Date: 09/15/2010
Action: Staff Letter

Global Id: T0611338487
Action Type: Other
Date: 12/16/2003
Action: Leak Discovery

Global Id: T0611338487
Action Type: RESPONSE
Date: 04/30/2004
Action: Other Report / Document

Global Id: T0611338487
Action Type: RESPONSE
Date: 12/03/2010
Action: Corrective Action Plan / Remedial Action Plan

Global Id: T0611338487
Action Type: RESPONSE
Date: 05/26/2011
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 05/04/2011
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 03/09/2011
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 03/24/2011
Action: Verbal Communication

Global Id: T0611338487
Action Type: REMEDIATION
Date: 12/02/2003
Action: Monitored Natural Attenuation

Global Id: T0611338487
Action Type: ENFORCEMENT
Date: 07/26/2010
Action: Staff Letter

Global Id: T0611338487
Action Type: ENFORCEMENT

GARY'S MOWHAWK SERVICE CASE #2 (Continued) **S101306161**

Date: 02/03/2011
Action: Staff Letter

Global Id: T0611338487
Action Type: RESPONSE
Date: 10/12/2011
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 11/21/2011
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 04/22/2011
Action: Final Remedial Action Report / Corrective Action Report

Global Id: T0611338487
Action Type: RESPONSE
Date: 12/06/2011
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 02/28/2012
Action: Verbal Communication

Global Id: T0611338487
Action Type: ENFORCEMENT
Date: 01/10/2012
Action: Staff Letter

Global Id: T0611338487
Action Type: ENFORCEMENT
Date: 01/23/2012
Action: Staff Letter

Global Id: T0611338487
Action Type: Other
Date: 12/16/2003
Action: Leak Stopped

Global Id: T0611338487
Action Type: RESPONSE
Date: 03/30/2012
Action: Well Destruction Workplan

Global Id: T0611338487
Action Type: RESPONSE
Date: 06/08/2012
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 08/21/2012
Action: Verbal Communication

GARY'S MOWHAWK SERVICE CASE #2 (Continued) **S101306161**

Global Id: T0611338487
Action Type: RESPONSE
Date: 08/21/2012
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 09/14/2012
Action: Well Destruction Report

Global Id: T0611338487
Action Type: ENFORCEMENT
Date: 08/24/2012
Action: Closure/No Further Action Letter

Global Id: T0611338487
Action Type: Other
Date: 04/04/2004
Action: Leak Reported

Global Id: T0611338487
Action Type: ENFORCEMENT
Date: 10/22/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611338487
Action Type: ENFORCEMENT
Date: 09/11/2008
Action: File review

Global Id: T0611338487
Action Type: ENFORCEMENT
Date: 07/02/2012
Action: Staff Letter

Global Id: T0611338487
Action Type: RESPONSE
Date: 08/31/2009
Action: Correspondence

Global Id: T0611338487
Action Type: RESPONSE
Date: 10/07/2009
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 09/29/2009
Action: Verbal Communication

Global Id: T0611338487
Action Type: ENFORCEMENT
Date: 07/14/2009
Action: Staff Letter

Global Id: T0611338487
Action Type: RESPONSE

GARY'S MOWHAWK SERVICE CASE #2 (Continued) **S101306161**

Date: 10/30/2009
Action: Soil and Water Investigation Workplan - Addendum

Global Id: T0611338487
Action Type: RESPONSE
Date: 04/14/2010
Action: Correspondence

Global Id: T0611338487
Action Type: RESPONSE
Date: 02/22/2010
Action: Correspondence

Global Id: T0611338487
Action Type: ENFORCEMENT
Date: 08/25/2009
Action: Staff Letter

Global Id: T0611338487
Action Type: ENFORCEMENT
Date: 01/19/2010
Action: Staff Letter

Global Id: T0611338487
Action Type: RESPONSE
Date: 10/30/2009
Action: Soil and Water Investigation Workplan

Global Id: T0611338487
Action Type: RESPONSE
Date: 07/13/2009
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 08/31/2009
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 09/22/2009
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 10/07/2009
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 07/12/2010
Action: Verbal Communication

Global Id: T0611338487
Action Type: RESPONSE
Date: 06/28/2010
Action: Correspondence

GARY'S MOWHAWK SERVICE CASE #2 (Continued) **S101306161**

Region:	STATE
Global Id:	T0611300087
Latitude:	38.58856
Longitude:	-121.512403
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	08/22/1991
Lead Agency:	YOLO COUNTY
Case Worker:	Not reported
Local Agency:	Not reported
RB Case Number:	570118
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0611300087
Contact Type:	Regional Board Caseworker
Contact Name:	DAVID STAVAREK
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	dstavarek@waterboards.ca.gov
Phone Number:	Not reported

Status History:

Global Id:	T0611300087
Status:	Open - Case Begin Date
Status Date:	08/03/1990
Global Id:	T0611300087
Status:	Open - Site Assessment
Status Date:	08/13/1990
Global Id:	T0611300087
Status:	Completed - Case Closed
Status Date:	08/22/1991

Regulatory Activities:

Global Id:	T0611300087
Action Type:	Other
Date:	08/03/1990
Action:	Leak Discovery
Global Id:	T0611300087
Action Type:	Other
Date:	08/03/1990
Action:	Leak Stopped
Global Id:	T0611300087
Action Type:	Other
Date:	08/13/1990
Action:	Leak Reported

GARY'S MOWHAWK SERVICE CASE #2 (Continued) **S101306161**

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 570118
Case Type: Soil only
Substance: GASOLINE
Staff Initials: DFS
Lead Agency: Local
Program: LUST
MTBE Code: N/A

E64 **ELMER'S SERVICE STATION** **CA HIST UST** **U001612325**
427 C ST **N/A**
< 1/8 **BRODERICK, CA 95605**
1 ft.

Site 7 of 15 in cluster E

Relative: Higher

Actual: 24 ft.

HIST UST:
Region: STATE
Facility ID: 00000051899
Facility Type: Gas Station
Other Type: Not reported
Contact Name: ELMER EUDY
Telephone: 9163720243
Owner Name: ELMER EDDY
Owner Address: 210 REDWOOD AVE
Owner City,St,Zip: SACRAMENTO, CA 95815
Total Tanks: 0003

Tank Num: 001
Container Num: 1
Year Installed: Not reported
Tank Capacity: 00001000
Tank Used for: PRODUCT
Type of Fuel: UNLEADED
Container Construction Thickness: Not reported
Leak Detection: Stock Inventor

Tank Num: 002
Container Num: 2
Year Installed: Not reported
Tank Capacity: 00001000
Tank Used for: PRODUCT
Type of Fuel: PREMIUM
Container Construction Thickness: Not reported
Leak Detection: Stock Inventor

Tank Num: 003
Container Num: 3
Year Installed: Not reported
Tank Capacity: 00001000
Tank Used for: PRODUCT
Type of Fuel: REGULAR
Container Construction Thickness: Not reported
Leak Detection: Stock Inventor

E65 **GARY'S MOHAWK STATION AND ADJACENT PARCEL, WEST SACRAMENTO** **FINDS** **1014676284**
427 C STREET **N/A**
< 1/8 **WEST SACRAMENTO, CA 95605**
1 ft.

Site 8 of 15 in cluster E

Relative:
Higher

FINDS:

Registry ID: 110041149021

Actual:
24 ft.

Environmental Interest/Information System
LEAKING UNDERGROUND STORAGE TANK - ARRA

E66 **ELMER'S SERVICE** **CA HIST UST** **U001612324**
427 C ST **N/A**
< 1/8 **BRODERICK, CA 95605**
1 ft.

Site 9 of 15 in cluster E

Relative:
Higher

HIST UST:

Region:	STATE
Facility ID:	00000015867
Facility Type:	Gas Station
Other Type:	Not reported
Contact Name:	ELMER EUDY
Telephone:	9163712185
Owner Name:	LEON CAGLE
Owner Address:	1436 DOBROS DR.
Owner City,St,Zip:	BRYTE, CA 95605
Total Tanks:	0003
Tank Num:	001
Container Num:	#3
Year Installed:	1970
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	PREMIUM
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	002
Container Num:	#1
Year Installed:	1965
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	003
Container Num:	#2
Year Installed:	1970
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor

Actual:
24 ft.

E67 **CITY OF WEST SACRAMENTO** **CA HAZNET** **S112989499**
427 C ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95605**
1 ft.

Site 10 of 15 in cluster E

Relative: HAZNET:
Higher

envid:	S112989499
Year:	2011
GEPAID:	CAC002670882
Contact:	PAUL DIRKSON
Telephone:	9166174555
Mailing Name:	Not reported
Mailing Address:	1110 W CAPITOL AVE
Mailing City,St,Zip:	WEST SACRAMENTO, CA 956912717
Gen County:	Not reported
TSD EPA ID:	CAD980675276
TSD County:	Not reported
Waste Category:	Contaminated soil from site clean-up
Disposal Method:	Landfill Or Surface Impoundment That Will Be Closed As Landfill(To Include On-Site Treatment And/Or Stabilization)
Tons:	84.96
Facility County:	Yolo

Actual:
24 ft.

E68 **SHEA T H** **EDR US Hist Auto Stat** **1009020863**
427 C ST **N/A**
< 1/8 **BRODERICK, CA**
1 ft.

Site 11 of 15 in cluster E

Relative: EDR Historical Auto Stations:
Higher

Name:	MADDOX CARROLL
Year:	1952
Type:	GASOLINE STATIONS
Name:	SHEA T H
Year:	1952
Type:	AUTOMOBILE REPAIRING
Name:	BRODERICK AUTO SERVICE
Year:	1956
Type:	AUTOMOBILE REPAIRING
Name:	BRODERICK MOHAWK SERVICE
Year:	1956
Type:	GASOLINE STATIONS
Name:	BRODERICK AUTO SERVICE
Year:	1957
Type:	AUTOMOBILE REPAIRING
Name:	BRODERICK MOHAWK SERVICE
Year:	1957
Type:	GASOLINE STATIONS
Name:	BRODERICK MOHAWK SERVICE
Year:	1961
Type:	GASOLINE STATIONS
Name:	BRODERICK AUTO SERVICE

Actual:
24 ft.

SHEA T H (Continued) **1009020863**

Year: 1961
Type: AUTOMOBILE REPAIRING

Name: BRODERICK AUTO SERVICE
Year: 1966
Type: AUTOMOBILE REPAIRING

Name: VERN S MOHAWK
Year: 1970
Type: GASOLINE STATIONS

Name: BRODERICK AUTO SERVICE
Year: 1970
Type: AUTOMOBILE REPAIRING

Name: BRODERICK AUTO SERVICE
Year: 1975
Type: AUTOMOBILE REPAIRING

Name: BRODERICK AUTO SERVICE
Year: 1982
Type: AUTOMOBILE REPAIRING

E69 **GARY'S SERVICE** **CA RGA LUST** **S114625752**
427 C ST **N/A**
< 1/8 **WEST SACRAMENTO, CA**
1 ft.

Site 12 of 15 in cluster E

Relative: RGA LUST:
Higher

2003	GARY'S SERVICE	427 C ST
2002	GARY'S SERVICE	427 C ST
2000	GARY'S SERVICE	427 C ST
1998	GARY'S SERVICE	427 C ST
1997	GARY'S SERVICE	427 C ST
1996	GARY'S SERVICE	427 C ST
1995	GARY'S SERVICE	427 C ST
1994	GARY'S SERVICE	427 C ST
1993	GARY'S SERVICE	427 C ST

Actual:
24 ft.

C70 **LEHRER VACANT LOT** **CA UST** **U003850884**
317-319 C ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
1 ft.

Site 4 of 8 in cluster C

Relative: YOLO CO. UST:
Higher

Facility Id:	FA0000586
Owner Id:	OW0000478
Owner Name:	LEHRER CO
Owner Address:	2601 N COMMONWEALTH
Owner City/State/Zip:	LOS ANGELES, CA 90027
Billing Name:	LEHRER COMPANY
Billing Address1:	2601 N COMMONWEALTH
Billing City/State/Zip:	LOS ANGELES, CA 90027
Contact Name:	Not reported

Actual:
22 ft.

LEHRER VACANT LOT (Continued) **U003850884**

Contact Phone:	Not reported
Current Status:	Inactive, non-billable
Program Element:	2306 - UST PERMANENT CLOSURE PERMIT
Business Code:	09 - UNKNOWN
Business Type:	6 - OTHER
Tank Number:	1
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	4,000
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	Not reported
INVGEN:	000586
Tank Number:	2
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	4,000
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	Not reported
INVGEN:	000586

C71 **DORRIS SHELL SERVICE** **EDR US Hist Auto Stat** **1009022013**
300 3RD ST **N/A**
< 1/8 **BRODERICK, CA**
1 ft.

Site 5 of 8 in cluster C

Relative: EDR Historical Auto Stations:
Higher

Name:	BRODERICK SERVICE STATION
Year:	1928
Type:	GASOLINE AND OIL SERVICE STATIONS

Actual:
21 ft.

Name:	BRODERICK SERVICE STATION
Year:	1928
Type:	GASOLINE AND OIL SERVICE STATIONS
Name:	MARSH J L
Year:	1942
Type:	GASOLINE AND OIL SERVICE STATIONS
Name:	DORRIS SHELL SERVICE
Year:	1956
Type:	GASOLINE STATIONS
Name:	DORRIS SHELL SERVICE
Year:	1957
Type:	GASOLINE STATIONS
Name:	SILVA SHELL SERVICE
Year:	1961
Type:	GASOLINE STATIONS

B72 **STORM DRAINAGE PUMP STATION** **CA UST** **U003850958**
326 5TH STREET **N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
1 ft.

Site 10 of 10 in cluster B

Relative:
Higher

Actual:
25 ft.

YOLO CO. UST:

Facility Id:	FA0003513
Owner Id:	OW0003189
Owner Name:	CITY OF WEST SACRAMENTO
Owner Address:	2101 STONE BLVD
Owner City/State/Zip:	WEST SACRAMENTO, CA 95691
Billing Name:	STORM DRAINAGE PUMP STATION
Billing Address1:	2101 STONE BLVD
Billing City/State/Zip:	WEST SACRAMENTO, CA 95691
Contact Name:	ELROD JAMES
Contact Phone:	916-373-5850
Current Status:	Inactive, non-billable
Program Element:	2306 - UST PERMANENT CLOSURE PERMIT
Business Code:	01 - CORPORATION
Business Type:	1 - MOTOR VEHICLE FUEL
Tank Number:	1
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	50
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	10/13/98
INVGEN:	1998003513

C73 **CA CHMIRS** **S109039002**
3RD & C ST. **N/A**
< 1/8 **WEST SACRAMENTO, CA**
1 ft.

Site 6 of 8 in cluster C

Relative:
Higher

Actual:
22 ft.

CHMIRS:

OES Incident Number:	06-0820
OES notification:	02/07/2006
OES Date:	Not reported
OES Time:	Not reported
Incident Date:	Not reported
Date Completed:	**Not reported**
Property Use:	Not reported
Agency Id Number:	Not reported
Agency Incident Number:	Not reported
Time Notified:	Not reported
Time Completed:	Not reported
Surrounding Area:	Not reported
Estimated Temperature:	Not reported
Property Management:	Not reported
More Than Two Substances Involved?:	Not reported
Resp Agncy Personel # Of Decontaminated:	Not reported
Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported

(Continued) **S109039002**

Others Number Of Fatalities:	Not reported
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA DOT PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	Not reported
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	Unknown
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	2006
Agency:	Kinder Morgan
Incident Date:	2/7/2006 12:00:00 AM
Admin Agency:	Yolo County Office of Emergency Services
Amount:	Not reported
Contained:	Yes
Site Type:	Other
E Date:	Not reported
Substance:	Smell of unk. product
Gallons:	0.000000
Unknown:	0
Substance #2:	Not reported
Substance #3:	Not reported
Evacuations:	0
Number of Injuries:	0
Number of Fatalities:	0
#1 Pipeline:	Not reported
#2 Pipeline:	Not reported
#3 Pipeline:	Not reported
#1 Vessel >= 300 Tons:	Not reported
#2 Vessel >= 300 Tons:	Not reported
#3 Vessel >= 300 Tons:	Not reported
Evacs:	Not reported
Injuries:	Not reported
Fatals:	Not reported
Comments:	Not reported
Description:	While REI Construction was excavating a trench they smelled product in the dirt and called the RP. RP advises they are shutting down the pipeline to investigate the odor.

C74 **CITY OF WEST SACRAMENTO** **CA HAZNET** **S112875540**
350 C ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
1 ft.

Site 7 of 8 in cluster C

Relative:
Higher

Actual:
23 ft.

HAZNET:

envid:	S112875540
Year:	1996
GEPAID:	CAC001222784
Contact:	CITY OF WEST SACRAMENTO
Telephone:	9163735850
Mailing Name:	Not reported
Mailing Address:	1951 S RIVER RD
Mailing City,St,Zip:	WEST SACRAMENTO, CA 956910000
Gen County:	Not reported
TSD EPA ID:	CAD982042475
TSD County:	Not reported
Waste Category:	Asbestos containing waste
Disposal Method:	Disposal, Land Fill
Tons:	26.1268
Facility County:	Yolo

E75 **GARY'S SERVICE** **CA RGA LUST** **S114625750**
427 C STREET **N/A**
< 1/8 **WEST SACRAMENTO, CA**
1 ft.

Site 13 of 15 in cluster E

Relative:
Higher

Actual:
24 ft.

RGA LUST:

1992	GARY'S SERVICE	427 C STREET	

E76 **GARY'S MOWHAWK SERVICE CASE #2** **CA LUST** **S106229795**
427 C STREET **N/A**
< 1/8 **WEST SACRAMENTO, CA 95605**
1 ft.

Site 14 of 15 in cluster E

Relative:
Higher

Actual:
24 ft.

LUST REG 5:

Region:	5
Status:	Preliminary site assessment underway
Case Number:	570326
Case Type:	Other ground water affected
Substance:	Not reported
Staff Initials:	DFS
Lead Agency:	Regional
Program:	LUST
MTBE Code:	N/A

C77 **THIRD & C STREET LLC** **CA HAZNET** **S112952155**
281 3RD ST **N/A**
< 1/8 **WEST SACRAMENTO, CA 95605**
1 ft.

Site 8 of 8 in cluster C

Relative: Higher

Actual: 21 ft.

HAZNET:

envid:	S112952155
Year:	2006
GEPAID:	CAC002601517
Contact:	JOHN LEONARD
Telephone:	9164438300
Mailing Name:	Not reported
Mailing Address:	2206 K ST STE 3
Mailing City,St,Zip:	SACRAMENTO, CA 95816
Gen County:	Not reported
TSD EPA ID:	CAD044003556
TSD County:	Not reported
Waste Category:	Unspecified oil-containing waste
Disposal Method:	Not reported
Tons:	0.2
Facility County:	Yolo

envid:	S112952155
Year:	2006
GEPAID:	CAC002601517
Contact:	JOHN LEONARD
Telephone:	9164438300
Mailing Name:	Not reported
Mailing Address:	2206 K ST STE 3
Mailing City,St,Zip:	SACRAMENTO, CA 95816
Gen County:	Not reported
TSD EPA ID:	CAD009466392
TSD County:	Not reported
Waste Category:	Other empty containers 30 gallons or more
Disposal Method:	Recycler
Tons:	0.5
Facility County:	Yolo

E78 **BROWNS SERVICE** **EDR US Hist Auto Stat** **1009022276**
421 C STREET **N/A**
< 1/8 **BRODERICK, CA**
1 ft.

Site 15 of 15 in cluster E

Relative: Higher

Actual: 24 ft.

EDR Historical Auto Stations:

Name:	BROWNS SERVICE
Year:	1966
Type:	GASOLINE STATIONS

79 **CITY OF SACRAMENTO - PW** **CA HAZNET** **S112931728**
JIBBOOM ST BRIDGE @ I ST **N/A**
< 1/8 **SACRAMENTO, CA 95814**
1 ft.

Relative:
Higher

Actual:
26 ft.

HAZNET:

envid:	S112931728
Year:	2003
GEPAID:	CAC002568375
Contact:	LAURA FISHER
Telephone:	9164332276
Mailing Name:	Not reported
Mailing Address:	5730 24TH ST BLDG 1
Mailing City,St,Zip:	SACRAMENTO, CA 95822
Gen County:	Not reported
TSD EPA ID:	NVD980895338
TSD County:	Not reported
Waste Category:	Other organic solids
Disposal Method:	Treatment, Incineration
Tons:	0.1
Facility County:	Sacramento

H80 **CRENSHAW CLYDE** **EDR US Hist Auto Stat** **1009021604**
SW **442 2ND ST** **N/A**
< 1/8 **BRODERICK, CA**
0.002 mi.
12 ft. **Site 4 of 4 in cluster H**

Relative:
Higher

Actual:
31 ft.

EDR Historical Auto Stations:

Name:	CRENSHAW CLYDE
Year:	1923
Type:	AUTOMOBILE REPAIRERS
Name:	CRENSHAW CLYDE
Year:	1923
Type:	AUTOMOBILE REPAIRERS

I81 **SING CHONG** **EDR US Hist Cleaners** **1009145727**
SSE **904 2ND ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.032 mi.
167 ft. **Site 1 of 6 in cluster I**

Relative:
Higher

Actual:
24 ft.

EDR Historical Cleaners:

Name:	SING CHONG
Year:	1923
Type:	LAUNDRIES
Name:	SING CHONG
Year:	1923
Type:	LAUNDRIES
Name:	SING CHONG LAUNDRY
Year:	1933
Type:	LAUNDRIES CHINESE
Name:	YEN FONG
Year:	1937

SING CHONG (Continued) **1009145727**

Type: LAUNDRIES-CHINESE

Name: SING CHONG
Year: 1942
Type: LAUNDRIES-ORIENTAL

Name: SING CHONG LAUNDRY
Year: 1956
Type: LAUNDRIES

J82 **UP, DOWNTOWN SAC - LAGOON** **CA HIST Cal-Sites** **S105954434**
SE **401 I STREET** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.032 mi.
167 ft. **Site 1 of 16 in cluster J**

Relative:
Higher

Actual:
24 ft.

Calsite:
Region: SACRAMENTO
Facility ID: 34400008
Facility Type: RP
Type: RESPONSIBLE PARTY
Branch: CC
Branch Name: CENTRAL CALIFORNIA
File Name: UP, DOWNTOWN SAC - LAGOON
State Senate District: 06031992
Status: ANNUAL WORKPLAN (AWP) - ACTIVE SITE
Status Name: ANNUAL WORKPLAN - ACTIVE SITE
Lead Agency: DEPT OF TOXIC SUBSTANCES CONTROL
NPL: Not Listed
SIC Code: 40
SIC Name: RAILROAD TRANSPORTATION
Access: Not reported
Cortese: Not reported
Hazardous Ranking Score: Not reported
Date Site Hazard Ranked: Not reported
Groundwater Contamination: Confirmed
Staff Member Responsible for Site: SGOSS
Supervisor Responsible for Site: Not reported
Region Water Control Board: Not reported
Region Water Control Board Name: Not reported
Lat/Long Direction: Not reported
Lat/Long (dms): 0 0 0 / 0 0 0
Lat/long Method: Not reported
Lat/Long Description: Not reported
State Assembly District Code: 09
State Senate District Code: 06
Facility ID: 34400008
Activity: DES
Activity Name: DESIGN
AWP Code: RDIP
Proposed Budget: 0
AWP Completion Date: Not reported
Revised Due Date: Not reported
Comments Date: 07292004
Est Person-Yrs to complete: 0
Estimated Size: Not reported
Request to Delete Activity: Not reported
Activity Status: AWP

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	RA
Activity Name:	REMOVAL ACTION
AWP Code:	NWLGN
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	10061993
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	2000
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	THE CONTAMINATED SOILS WERE EXCAVATED & STOCKPILED FOR TRANSPORTATION,TREATMENT, AND REUSE IN UTAH.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	RA
Activity Name:	REMOVAL ACTION
AWP Code:	LSARA
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	04271995
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	2500
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	EXCAVATION REMEDIATION OF CONTAMINATED SOILS FROM THE INDUSTRIALWASTE

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

	WATER LAGOON.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	RIFS
Activity Name:	REMEDIAL INVESTIGATION / FEASIBILITY STUDY
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	11251997
Est Person-Yrs to complete:	0.19000
Estimated Size:	M
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	12301998
Est Person-Yrs to complete:	0
Estimated Size:	M
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	DES
Activity Name:	DESIGN
AWP Code:	Not reported

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05222000
Est Person-Yrs to complete:	0
Estimated Size:	M
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	RIFS
Activity Name:	REMEDIAL INVESTIGATION / FEASIBILITY STUDY
AWP Code:	GW
Proposed Budget:	0
AWP Completion Date:	09302005
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	RMDL
Activity Name:	REMEDIAL ACTION (RAP REQUIRED)
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	09302007
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	L
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	GW
Proposed Budget:	0
AWP Completion Date:	06302006
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	DES
Activity Name:	DESIGN
AWP Code:	GW
Proposed Budget:	0
AWP Completion Date:	03302007
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	RMDL
Activity Name:	REMEDIAL ACTION (RAP REQUIRED)
AWP Code:	GW
Proposed Budget:	0
AWP Completion Date:	09302008
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	CERT
Activity Name:	CERTIFICATION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	09302010
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	L
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	OM
Activity Name:	OPERATION & MAINTENANCE
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	09302034
Revised Due Date:	Not reported

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	L
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	NOD
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	12301998
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	NOD
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02162000
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	FARAP
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02162000
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	DEED
Activity Name:	DEED RESTRICTIONS
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	07112001
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	NWLSA
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	NOD
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	ACP
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400008
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	NOE
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Alternate Address:	401 I STREET
Alternate City,St,Zip:	SACRAMENTO, CA 95814
Background Info:	The Southern Pacific Transportation Company's (SPTCo) Sacramento Railyard Facility has been in operation since 1865. The site is approximately 240 acres. Inorganic and organic contamination are broadly distributed across a majority of the site. Additionally, liquid waste was historically disposed of in an industrial sewer system constructed over 100 years ago. On June 2, 1988, the Department and SPTCo entered into an Enforceable Agreement. A workplan and schedule for investigatio and cleanup was finalized in October of 1988. Based on historical usage and known contamination the site wa divided into six study areas: Central Shops (CSSA), Central Corridor (CCSA), Car Shop Nine (CSNSA), Lagoon (LSA), Northern Shops (NSSA) and Sacramento Station (SSSA). The Lagoon Study Area contains the former industrial waste water lagoon, an API oil/water separator overflow area, and the former location of a 50,000 gallon barrel oil storage tank. The soil and groundwater are extensively contaminated. Soil contami-

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

	nation includes metals, Volatile Organic Compounds (VOC's), Semi Volatile Organic Compounds (SVOC's) including Poly Nuclear Aromatics (PAH's), and total Petroleum Hydrocarbons (TPH). Groundwater contamination includes metals, VOC's, SVOC's, and TPH.
Comments Date:	05072003
Comments:	In compliance with CEQA, DTSC has prepared a Notice of
Comments Date:	05072003
Comments:	Determination (NOD) for this project. A comment period for the
Comments Date:	05072003
Comments:	project was held from February 25 through March 27, 2003. A
Comments Date:	12301998
Comments:	RAP -- DTSC APPROVED THE FINAL RAP, DATED 12/28/98, APPROVED
Comments Date:	12301998
Comments:	12/30/98, FOR THE LSA 51 ACRES OF THE 240-ACRE SPTCO-SACRA-
Comments Date:	12301998
Comments:	MENTO RAILYARD SITE. THE APPROVED ALTERNATIVE FOR REMEDIATION
Comments Date:	05072003
Comments:	public meeting was held on March 11, 2003. Public comments were
Comments Date:	05072003
Comments:	received by DTSC and addressed through a responsiveness summary.
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	CEQA/NOD--An NOD was approved for actions selected under a
Comments Date:	05072003
Comments:	Remedial Action Plan Amendment prepared for soil remediation
Comments Date:	05072003
Comments:	of an 11 acre Northwestern portion of the Lagoon Study Area.
Comments Date:	05072003
Comments:	DTSC prepared an Initial Study Agency Checklist which relies on
Comments Date:	05072003
Comments:	the City of Sacramento EIRs prepared for redevelopment projects
Comments Date:	05072003
Comments:	which includes the Railyard. The NOD and supporting evaluations
Comments Date:	05072003
Comments:	were made available for public review for 30 days from 2/25/03
Comments Date:	05072003
Comments:	to 3/27/03 and was presented at the 3/11/03 public meeting held
Comments Date:	05072003
Comments:	at the Sacramento Amtrak Depot. A notice was displayed in the
Comments Date:	05072003
Comments:	Sacramento Bee newspaper and a fact sheet was mailed to the site
Comments Date:	05072003
Comments:	mailing list to provide information and announce the review
Comments Date:	05072003
Comments:	period and a public meeting.
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP)
Comments Date:	05072003
Comments:	prepared to amend the February 2000 Final Amended Industrial
Comments Date:	05072003
Comments:	Wastewater Lagoon RAP, and February 2000 Final Central Corridor,
Comments Date:	05072003
Comments:	Car Shop Nine and Northern Shops RAP for Soil. The ACP

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

Comments Date:	05072003
Comments:	establishes the process to identify the presence of and safety
Comments Date:	05072003
Comments:	clean up of asbestos if found during future soil excavation.
Comments Date:	05072003
Comments:	In compliance with CEQA, DTSC has prepared a notice of
Comments Date:	05072003
Comments:	exemption. A comment period for the project was held from
Comments Date:	05072003
Comments:	February 25 through March 27, 2003. A public meeting was held on
Comments Date:	05072003
Comments:	March 11, 2003. Public comments were received by DTSC and
Comments Date:	05072003
Comments:	addressed through a responsiveness summary.
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an
Comments Date:	05072003
Comments:	Asbestos Contingency Plan (ACP) prepared to amend the February
Comments Date:	05072003
Comments:	2000 Final Amended Industrial Wastewater Lagoon RAP, and
Comments Date:	05072003
Comments:	February 2000 Final Central Corridor, Car Shop Nine, and Northern
Comments Date:	05072003
Comments:	Shops RAP for Soil. The ACP establishes the process to identify
Comments Date:	05072003
Comments:	the presence of and safely clean up asbestos if found during
Comments Date:	05072003
Comments:	future soil excavation. A comment period for the project was
Comments Date:	05072003
Comments:	held from 2/25/03 to 3/27/03. A public meeting was held on
Comments Date:	05072003
Comments:	3/11/03. Public comments were received by DTSC and addressed
Comments Date:	05072003
Comments:	through a responsiveness summary.
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05222000
Comments:	DES - The DTSC approved the Final Remediation Design and Imple-
Comments Date:	05222000
Comments:	mentation Report (RDIP) on May 22, 2000, for the Lagoon Study
Comments Date:	05222000
Comments:	Area, 51 acres of the 240 acre SPTCo - Sacramento Rail Yard
Comments Date:	05222000
Comments:	Site. The approved RDIP for remediation for the 239,640 cubic
Comments Date:	05222000

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

Comments:	yards of contaminated soils consists of excavation, ex-situ vapor
Comments Date:	05222000
Comments:	extraction, chemical stabilization and, off-site disposal. Imple-
Comments Date:	05222000
Comments:	mentation of the RDIP is scheduled to begin in May of 2000, and
Comments Date:	05222000
Comments:	to continue through October of 2005. The preliminary costs of the
Comments Date:	05222000
Comments:	remediation is estimated to be $17,115,480.
Comments Date:	07292004
Comments:	DES/RDIP -- DESIGN/REMEDIAL DESIGN IMPLEMENTATION PLAN. THE
Comments Date:	07292004
Comments:	LAGOON STUDY AREA (LSA) IS APPROXIMATELY 434 ACRES OF THE
Comments Date:	07292004
Comments:	240 ACRE FORMER SPTCO RAIL YARD LOCATED IN DOWNTOWN SACRAMENTO.
Comments Date:	07292004
Comments:	THE LSA WAS UTILIZED FOR AS AN INDUSTRIAL WASTEWATER LAGOON, OIL/
Comments Date:	07292004
Comments:	WATER SEPERATOR OVERFLOW AREA, AND FORMER LOCATION OF A 50,000
Comments Date:	07292004
Comments:	GALLON OIL STORAGE TANK. THE RDIP 2004 PROVIDES FOR EXCAVATIONS,
Comments Date:	07292004
Comments:	STORAGE, TREATMENT, AND OFFSITE DISPOSAL OF APPROXIMATELY 120,000
Comments Date:	07292004
Comments:	CUBIC YARDS OF SOIL CONTAMINATED VOLATILE ORGANIC COMPOUNDS
Comments Date:	07292004
Comments:	SVOCs, AND TOTAL PETROLEUM HYDROCARBON (TPH) IN THE LAGOON STUDY
Comments Date:	07292004
Comments:	AREA, AND CENTRAL CORRIDOR STUDY AREA, AND CAR SHOP NINE STUDY
Comments Date:	07292004
Comments:	AREA FOR WHICH REMEDIAL ACTION PLANS (RAPs) HAVE BEEN PREVIOUSLY
Comments Date:	07292004
Comments:	APPROVED.
Comments Date:	09021993
Comments:	RA (NWLGN) -- SURFACE CONTAMINATION WAS OBSERVED IN THE
Comments Date:	09021993
Comments:	NORTHWEST CORNER OF THE LAGOON SITE. THE AREA WAS
Comments Date:	09021993
Comments:	PREVIOUSLY USED AS A TANK STORAGE AREA FOR BUNKER C OIL.
Comments Date:	09021993
Comments:	TESTING CONFIRMED BUNKER C, A HEAVY BLACK OIL, WAS
Comments Date:	09021993
Comments:	THE MAJOR CONTAMINANT PRESENT. FROM AUGUST 27 THRU
Comments Date:	09021993
Comments:	SEPTEMBER 2, 1993, THE CONTAMINATED SOILS WERE EXCAVATED
Comments Date:	09021993
Comments:	AND STOCKPILED FOR TRANSPORTATION, TREATMENT AND REUSE
Comments Date:	09021993
Comments:	IN UTAH.
Comments Date:	09021993
Comments:	APPROX. 2,000 CUBIC YARDS EXCAVATED.
Comments Date:	09021993
Comments:	TOTAL COST APPROX. $250,000 (RP)
Comments Date:	11251997
Comments:	RIFS -- The LSA represents 51 acres of the 240 acre SPTCo-
Comments Date:	11251997
Comments:	Sacramento Rail Yard. The approved RIFS has initially

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

Comments Date:	11251997
Comments:	identified 51,965 cubic yards of contaminated soils that
Comments Date:	11251997
Comments:	will require offsite disposal and 187,675 cubic yards of
Comments Date:	11251997
Comments:	contaminated soils that will be disposed of onsite. The
Comments Date:	11251997
Comments:	onsite disposal alternative includes design and construction
Comments Date:	11251997
Comments:	of an onsite 450,000 cubic yard solid waste landfill,
Comments Date:	11251997
Comments:	primarily designed for relatively intert metals contaminated
Comments Date:	11251997
Comments:	soils. The landfill will be designed and constucted as a
Comments Date:	11251997
Comments:	Class II landfill. The onsite landfill has been approved
Comments Date:	11251997
Comments:	with the following requirements: no liquids may be disposed
Comments Date:	11251997
Comments:	of onsite, all metal contaminated soils with organics may
Comments Date:	11251997
Comments:	only be placed in the landfill if the organic constituents
Comments Date:	11251997
Comments:	are all less than threshold values, no RCRA waste, and no
Comments Date:	11251997
Comments:	California Hazardous Waste that has not been classified as
Comments Date:	11251997
Comments:	designated waste. The preliminary cost of the proposed
Comments Date:	11251997
Comments:	alternative, Alternative H, is $20,315,000. The final RAP
Comments Date:	11251997
Comments:	is scheduled for completion in September 1998.
Comments Date:	11251997
Comments:	Not reported
Comments Date:	12301998
Comments:	FOR THE 239,640 CUBIC YARDS OF CONTAMINATED SOILS IDENTIFIED
Comments Date:	12301998
Comments:	IN THE RAP IS EXCAVATION, EX-SITU VAPOR EXTRACTION, CHEMICAL
Comments Date:	12301998
Comments:	STABILIZATION, ONSITE SECURE CONTAINMENT AND OFFSITE DISPOSAL.
Comments Date:	12301998
Comments:	THE ONSITE DISPOSAL ALTERNATIVE INCLUDES DESIGN AND CONSTRUCTION
Comments Date:	12301998
Comments:	OF AN ONSITE, 450,000 CUBIC YARD SOLD WASTE LANDFILL, PRIMARILY
Comments Date:	12301998
Comments:	DESIGNED FOR RELATIVELY INERT METALS CONTAMINATED SOILS. THE
Comments Date:	12301998
Comments:	LANDFILL WILL BE DESIGNED AND CONSTRUCTED AS A CLASS II LANDFILL.
Comments Date:	12301998
Comments:	THE ONSITE LANDFILL HAS BEEN APPROVED WITH THE FOLLOWING REQUIRE-
Comments Date:	12301998
Comments:	MENTS: NO LIQUIDS MAY BE DISPOSED ONSITE, ALL METAL CONTAMINATED
Comments Date:	12301998
Comments:	SOILS WITH ORGANICS MAY ONLY BE PLACED IN THE LANDFILL IF THE
Comments Date:	12301998
Comments:	ORGANIC CONSTITUENTS ARE ALL LESS THAN THRESHOLD VALUES, NO RCRA
Comments Date:	12301998

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

Comments:	WASTES, AND NO CALIFORNIA HAZARDOUS WASTE THAT HAS NOT BEEN
Comments Date:	12301998
Comments:	CLASSIFIED AS DESIGNATED WASTE. IMPLEMENTATION OF THE SELECTED
Comments Date:	12301998
Comments:	ALTERNATIVE IS SCHEDULED TO BEGIN IN APRIL OF 2000 AND TO CONTINU
Comments Date:	12301998
Comments:	THROUGH OCTOBER OF 2005. THE PRELIMINARY COST OF THE PROPOSED
Comments Date:	12301998
Comments:	ALTERNATIVE IS EXTIMATED TO BE $20,315,000.
Comments Date:	12301998
Comments:	Not reported
Comments Date:	12301998
Comments:	CEQA - The DTSC issued the Notice of Determination for the
Comments Date:	12301998
Comments:	Lagoon Study Area Final RAP, approved remedial alternative on
Comments Date:	12301998
Comments:	December 30, 1999.
Comments Date:	02162000
Comments:	RAP/FARAP - The DTSC approved the Final Amended RAP (FARAP),
Comments Date:	02162000
Comments:	for the LSA 51 acres of the 240 acre SPTCo-Sacramento Rail Yard
Comments Date:	02162000
Comments:	site. The approved alternative for remediation for the 239,640
Comments Date:	02162000
Comments:	cubic yards of contaminated soils identified in the FARAP is
Comments Date:	02162000
Comments:	excavation, ex-situ vapor extraction, chemical stabilization and
Comments Date:	02162000
Comments:	off-site disposal. Implementation of the selected alternative is
Comments Date:	02162000
Comments:	scheduled to begin in May of 2000 and to continue through October
Comments Date:	02162000
Comments:	2005. The preliminary cost of the proposed alternative is
Comments Date:	02162000
Comments:	estimated to be $17,115,480.
Comments Date:	02162000
Comments:	CEQA/NOD - The DTSC approved the Notice of Determination for the
Comments Date:	02162000
Comments:	LSA Final Amended (FARAP), and the NSSA, CSNSA, and CCSA Final
Comments Date:	02162000
Comments:	Remedial Action Plan (FRAP).
Comments Date:	04271995
Comments:	RA (LSARA) -- The Interim Remedial Measure (IRM) is being
Comments Date:	04271995
Comments:	implemented for remediation of soil contaminated
Comments Date:	04271995
Comments:	with Volatile Organic Compounds (VOC's), Semi-Volatile
Comments Date:	04271995
Comments:	Organic Compounds (SVOC's), and metals from operation
Comments Date:	04271995
Comments:	and maintenance activities at the SPTCo-Sacramento
Comments Date:	04271995
Comments:	Rail Yard. The IRM consists of excavation remediation of
Comments Date:	04271995
Comments:	approximately 2500 cubic yards of contaminated soils from
Comments Date:	04271995
Comments:	the Industrial Waste Water Lagoon. The contaminated soil

UP, DOWNTOWN SAC - LAGOON (Continued) **S105954434**

Comments Date:	04271995
Comments:	will be stockpiled and treated at the Drum Storage Area (DSA
Comments Date:	04271995
Comments:	utilizing the existing DSA soil vapor extraction and treatme
Comments Date:	04271995
Comments:	system to remediate VOC contamination. The VOC remediated
Comments Date:	04271995
Comments:	soils will then be chemically stabilized/solidified to treat
Comments Date:	04271995
Comments:	SVOC and metal contamination. The remediated/stabilized
Comments Date:	04271995
Comments:	soil will then be disposed of at the ECDC Utah Landfill.
Comments Date:	05072003
Comments:	RAP/NWLSA--DTSC approved a RAP amendment for soil cleanup of an
Comments Date:	05072003
Comments:	11 acre portion of the Lagoon Study Area (LSA) of the railyard
Comments Date:	05072003
Comments:	site. The Amendment to the 2000 Final Amended Industrial
Comments Date:	05072003
Comments:	Wastewater Lagoon Remedial Action Plan for Soil changes the
Comments Date:	05072003
Comments:	remedy for the northwestern corner of the LSA from excavation
Comments Date:	05072003
Comments:	and offsite disposal to grading and capping with an engineered
Comments Date:	05072003
Comments:	paved cover. Land use will be limited under a deed restriction.
ID Name:	CALSITES ID NUMBER
ID Value:	34400004
ID Name:	CALSTARS CODE
ID Value:	100139
Alternate Name:	SOUTHERN PACIFIC TRANSPORTATION COSP, SAC - LAGOONSP-SAC - LOCOMOTIVE WORKSSP-SAC - OVERALL SITESACRAMENTO RAILYARD FACILITYUNION PACIFIC RAILROAD-SACRAMENTO RAILYDUP, DOWNTOWN SAC - LAGOON
Special Programs Code:	Not reported
Special Programs Name:	Not reported

J83 **SP SACRAMENTO RAIL YARD** **CA FID UST** **S101590405**
SE **401 I ST** **CA SWEEPS UST** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.032 mi.
167 ft. **Site 2 of 16 in cluster J**

Relative:
Higher

Actual:
24 ft.

CA FID UST:

Facility ID:	34000185
Regulated By:	UTNKA
Regulated ID:	00054635
Cortese Code:	Not reported
SIC Code:	Not reported
Facility Phone:	9164491683
Mail To:	Not reported
Mailing Address:	1 MARKET PLAZA
Mailing Address 2:	Not reported
Mailing City,St,Zip:	SACRAMENTO 95814
Contact:	Not reported
Contact Phone:	Not reported
DUNs Number:	Not reported
NPDES Number:	Not reported
EPA ID:	Not reported

SP SACRAMENTO RAIL YARD (Continued) **S101590405**

Comments: Not reported
Status: Active

SWEEPS UST:
Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: S/N 1042
SWRCB Tank Id: 34-000-054635-000001
Tank Status: A
Capacity: 9000
Active Date: 07-01-85
Tank Use: UNKNOWN
STG: W
Content: Not reported
Number Of Tanks: 18

Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: 7
SWRCB Tank Id: 34-000-054635-000002
Tank Status: A
Capacity: 1000
Active Date: 07-01-85
Tank Use: M.V. FUEL
STG: P
Content: LEADED
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: EL 4527
SWRCB Tank Id: 34-000-054635-000003
Tank Status: A
Capacity: 900
Active Date: 07-01-85
Tank Use: UNKNOWN
STG: P
Content: Not reported
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635

SP SACRAMENTO RAIL YARD (Continued) **S101590405**

Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: EL 4216
SWRCB Tank Id: 34-000-054635-000004
Tank Status: A
Capacity: 450
Active Date: 07-01-85
Tank Use: UNKNOWN
STG: W
Content: Not reported
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: 10
SWRCB Tank Id: 34-000-054635-000005
Tank Status: A
Capacity: Not reported
Active Date: 07-01-85
Tank Use: M.V. FUEL
STG: P
Content: UNKNOWN
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: 2
SWRCB Tank Id: 34-000-054635-000007
Tank Status: A
Capacity: 2000
Active Date: 07-01-85
Tank Use: M.V. FUEL
STG: P
Content: DIESEL
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: 13

SP SACRAMENTO RAIL YARD (Continued) **S101590405**

SWRCB Tank Id: 34-000-054635-000008
Tank Status: A
Capacity: Not reported
Active Date: 07-01-85
Tank Use: M.V. FUEL
STG: P
Content: UNKNOWN
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: 14
SWRCB Tank Id: 34-000-054635-000009
Tank Status: A
Capacity: 1800
Active Date: 07-01-85
Tank Use: UNKNOWN
STG: P
Content: Not reported
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: 15
SWRCB Tank Id: 34-000-054635-000010
Tank Status: A
Capacity: 5200
Active Date: 07-01-85
Tank Use: UNKNOWN
STG: W
Content: Not reported
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: 17
SWRCB Tank Id: 34-000-054635-000011
Tank Status: A
Capacity: 2000
Active Date: 07-01-85
Tank Use: M.V. FUEL
STG: P

SP SACRAMENTO RAIL YARD (Continued) **S101590405**

Content: UNKNOWN
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: 18
SWRCB Tank Id: 34-000-054635-000012
Tank Status: A
Capacity: 500
Active Date: 07-01-85
Tank Use: M.V. FUEL
STG: P
Content: DIESEL
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: 19
SWRCB Tank Id: 34-000-054635-000013
Tank Status: A
Capacity: 1000
Active Date: 07-01-85
Tank Use: M.V. FUEL
STG: P
Content: LEADED
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: 20
SWRCB Tank Id: 34-000-054635-000014
Tank Status: A
Capacity: 1000
Active Date: 07-01-85
Tank Use: M.V. FUEL
STG: P
Content: LEADED
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635
Number: 9

SP SACRAMENTO RAIL YARD (Continued) **S101590405**

Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: 21
SWRCB Tank Id: 34-000-054635-000015
Tank Status: A
Capacity: 1000
Active Date: 07-01-85
Tank Use: UNKNOWN
STG: W
Content: Not reported
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: Y-6426
SWRCB Tank Id: 34-000-054635-000016
Tank Status: A
Capacity: 1900
Active Date: 07-01-85
Tank Use: UNKNOWN
STG: W
Content: Not reported
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: Y-6451
SWRCB Tank Id: 34-000-054635-000017
Tank Status: A
Capacity: 3600
Active Date: 07-01-85
Tank Use: UNKNOWN
STG: W
Content: Not reported
Number Of Tanks: Not reported

Status: Active
Comp Number: 54635
Number: 9
Board Of Equalization: 44-019418
Referral Date: 06-22-90
Action Date: 06-22-90
Created Date: 02-29-88
Owner Tank Id: Y-6437
SWRCB Tank Id: 34-000-054635-000018

SP SACRAMENTO RAIL YARD (Continued) **S101590405**

Tank Status:	A
Capacity:	3600
Active Date:	07-01-85
Tank Use:	UNKNOWN
STG:	W
Content:	Not reported
Number Of Tanks:	Not reported

Status:	Active
Comp Number:	54635
Number:	9
Board Of Equalization:	44-019418
Referral Date:	06-22-90
Action Date:	06-22-90
Created Date:	02-29-88
Owner Tank Id:	26
SWRCB Tank Id:	34-000-054635-000019
Tank Status:	A
Capacity:	800
Active Date:	07-01-85
Tank Use:	UNKNOWN
STG:	W
Content:	Not reported
Number Of Tanks:	Not reported

Status:	Not reported
Comp Number:	54635
Number:	Not reported
Board Of Equalization:	44-019418
Referral Date:	Not reported
Action Date:	Not reported
Created Date:	Not reported
Owner Tank Id:	Not reported
SWRCB Tank Id:	34-000-054635-000006
Tank Status:	Not reported
Capacity:	12500
Active Date:	Not reported
Tank Use:	M.V. FUEL
STG:	PRODUCT
Content:	UNKNOWN
Number Of Tanks:	1

J84 **SACRAMENTO (P&M)** **CA HIST UST** **U001615177**
SE **401 I ST** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.032 mi.
167 ft. **Site 3 of 16 in cluster J**

Relative:
Higher

Actual:
24 ft.

HIST UST:

Region:	STATE
Facility ID:	00000063980
Facility Type:	Other
Other Type:	RAILROAD
Contact Name:	Not reported
Telephone:	9167869120
Owner Name:	SOUTHERN PACIFIC TRANSPORTATIO
Owner Address:	ONE MARKET PLAZA, ROOM 1007
Owner City,St,Zip:	SAN FRANCISCO, CA 94105

SACRAMENTO (P&M) (Continued) **U001615177**

Total Tanks:	0002
Tank Num:	001
Container Num:	14
Year Installed:	Not reported
Tank Capacity:	00012000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	002
Container Num:	15
Year Installed:	Not reported
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	None

J85 **SOUTHERN PACIFIC RAILYARDS** **CA Sacramento Co. CS** **S117397088**
SE **401 I ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.032 mi.
167 ft. **Site 4 of 16 in cluster J**

Relative:
Higher

Actual:
24 ft.

Sacramento Co. CS:

State Site Number:	Not reported
Lead Staff:	Not reported
Lead Agency:	Not reported
Remedial Action Taken:	NO
Substance:	Not reported
Date Reported:	Not reported
Facility Id:	RO0001696
Case Type:	Not reported
Case Closed:	Not reported
Date Closed:	**Not reported**

J86 **SP, SAC - SAND PILES** **CA HIST Cal-Sites** **S100351371**
SE **401 I STREET** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.032 mi.
167 ft. **Site 5 of 16 in cluster J**

Relative:
Higher

Actual:
24 ft.

Calsite:

Region:	SACRAMENTO
Facility ID:	34320031
Facility Type:	RP
Type:	RESPONSIBLE PARTY
Branch:	CC
Branch Name:	CENTRAL CALIFORNIA
File Name:	Not reported
State Senate District:	06221990
Status:	CERTIFIED AS HAVING BEEN REMEDIED SATISFACTORILY UNDER DTSC OVERSIGHT
Status Name:	CERTIFIED
Lead Agency:	N/A

SP, SAC - SAND PILES (Continued) **S100351371**

NPL: Unknown
SIC Code: 32
SIC Name: MANU - STONE, CLAY & GLASS PRODUCTS
Access: Not reported
Cortese: Not reported
Hazardous Ranking Score: Not reported
Date Site Hazard Ranked: Not reported
Groundwater Contamination: Not reported
Staff Member Responsible for Site: SGOSS
Supervisor Responsible for Site: Not reported
Region Water Control Board: Not reported
Region Water Control Board Name: Not reported
Lat/Long Direction: Not reported
Lat/Long (dms): 0 0 0 / 0 0 0
Lat/long Method: Not reported
Lat/Long Description: Not reported
State Assembly District Code: 09
State Senate District Code: 06
Facility ID: 34320031
Activity: CERT
Activity Name: CERTIFICATION
AWP Code: Not reported
Proposed Budget: 0
AWP Completion Date: Not reported
Revised Due Date: Not reported
Comments Date: 06221990
Est Person-Yrs to complete: 0
Estimated Size: Not reported
Request to Delete Activity: Not reported
Activity Status: CERT
Definition of Status: CERTIFIED
Liquids Removed (Gals): 1169
Liquids Treated (Gals): 2341
Action Included Capping: Not reported
Well Decommissioned: Not reported
Action Included Fencing: Not reported
Removal Action Certification: N
Activity Comments: THE MATERIAL WAS SEGREGATED. THE MAJORITY WAS RECYCLED IN THEPRODUCTION OF ASPHALT. SOME MATERIAL WAS DISPOSED OF AT A CLASS ILANDFILL.
For Commercial Reuse: 0
For Industrial Reuse: 0
For Residential Reuse: 0
Unknown Type: 0
Facility ID: 34320031
Activity: FRA
Activity Name: FINAL REMEDIAL ACTION
AWP Code: Not reported
Proposed Budget: 0
AWP Completion Date: Not reported
Revised Due Date: Not reported
Comments Date: 11241989
Est Person-Yrs to complete: 0
Estimated Size: Not reported
Request to Delete Activity: Not reported
Activity Status: CERT
Definition of Status: CERTIFIED

SP, SAC - SAND PILES (Continued) **S100351371**

Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Alternate Address:	401 I STREET
Alternate City,St,Zip:	SACRAMENTO, CA 95814
Background Info:	The Sand Piles Site was the location on the Southern Pacific Transportation Compnay's Sacramento facility at which spent sand blasting grit was stored. Spent sand blasting material is now placed in drums and handled as hazardous waste. Remediation of the Site included the Recylcling of, as a component of asphalt, 2,341 tons of sand. Additionally 897 tons of material was disposed of at a Class I landfill and 236 tons of condrete, wood, and metal debris was disposed of at a Class III landfill. The Department's goal for cleanup was to acheive a level of total lead in the soils below 950 mg of lead/kg of soil. This goal was met. Levels of lead exceeding the STLC of 5.0 mg of lead/kg have been found at and adjacent to the to the previous location of the sand piles. The Department has determined that the remaining contamination is part of a general overall condition at the facility. This contamination will be addressed as part of the overall site investigation and remediation.
Comments Date:	06221990
Comments:	Certified. DHS cleanup goal of 950 mg of lead/kg of soil was
Comments Date:	06221990
Comments:	met.
Comments Date:	09271989
Comments:	Remedial Action initiated.
Comments Date:	11241989
Comments:	Remedial action completed. The material was segregated.
Comments Date:	11241989
Comments:	The majority was recycled in the production of asphalt.
Comments Date:	11241989
Comments:	Some material was disposed of at a Class I landfill.
Comments Date:	11241989
Comments:	Concrete, wood, and metal debris were taken to a Class III
Comments Date:	11241989
Comments:	landfill. 2,341 tons were recycled, 1,169 tons were
Comments Date:	11241989
Comments:	removed.
ID Name:	CALSITES ID NUMBER
ID Value:	34400004
ID Name:	CALSTARS CODE
ID Value:	100139
Alternate Name:	SP, SAC - SAND PILESSOUTHERN PACIFIC TRANSPORTATION CO
Special Programs Code:	Not reported
Special Programs Name:	Not reported

J87 **SACRAMENTO LOCOMOTIVE WORKS** **CA HIST UST** **U001615182**
SE **401 I ST** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.032 mi.
167 ft. **Site 6 of 16 in cluster J**

Relative:
Higher

Actual:
24 ft.

HIST UST:

Region:	STATE
Facility ID:	00000054635
Facility Type:	Other
Other Type:	RAILYARD
Contact Name:	MR. R.T. GILL
Telephone:	9164491822
Owner Name:	SOUTHERN PACIFIC TRANSPORTATIO
Owner Address:	ONE MARKET PLAZA, SOUTHERN PAC
Owner City,St,Zip:	SAN FRANCISCO, CA 94105
Total Tanks:	0026
Tank Num:	001
Container Num:	5
Year Installed:	Not reported
Tank Capacity:	00000000
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	002
Container Num:	S/N 1042
Year Installed:	1960
Tank Capacity:	00009000
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Visual
Tank Num:	003
Container Num:	7
Year Installed:	Not reported
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	004
Container Num:	EL 4527
Year Installed:	1951
Tank Capacity:	00000900
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Visual
Tank Num:	005
Container Num:	EL-4216
Year Installed:	1951
Tank Capacity:	00000450
Tank Used for:	WASTE

SACRAMENTO LOCOMOTIVE WORKS (Continued) **U001615182**

Type of Fuel: Not reported
Container Construction Thickness: Not reported
Leak Detection: Visual

Tank Num: 006
Container Num: 10
Year Installed: Not reported
Tank Capacity: 00000000
Tank Used for: PRODUCT
Type of Fuel: 06
Container Construction Thickness: Not reported
Leak Detection: None

Tank Num: 007
Container Num: 1
Year Installed: Not reported
Tank Capacity: 00000000
Tank Used for: PRODUCT
Type of Fuel: 06
Container Construction Thickness: Not reported
Leak Detection: None

Tank Num: 008
Container Num: 2
Year Installed: Not reported
Tank Capacity: 00002000
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Container Construction Thickness: Not reported
Leak Detection: None

Tank Num: 009
Container Num: 3
Year Installed: 1968
Tank Capacity: 00022000
Tank Used for: WASTE
Type of Fuel: Not reported
Container Construction Thickness: Not reported
Leak Detection: None

Tank Num: 010
Container Num: 4
Year Installed: Not reported
Tank Capacity: 00024000
Tank Used for: WASTE
Type of Fuel: Not reported
Container Construction Thickness: Not reported
Leak Detection: None

Tank Num: 011
Container Num: 11
Year Installed: Not reported
Tank Capacity: 00000000
Tank Used for: WASTE
Type of Fuel: Not reported
Container Construction Thickness: Not reported
Leak Detection: None

SACRAMENTO LOCOMOTIVE WORKS (Continued) **U001615182**

Tank Num:	012
Container Num:	12
Year Installed:	1968
Tank Capacity:	00022000
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	013
Container Num:	13
Year Installed:	Not reported
Tank Capacity:	00000000
Tank Used for:	PRODUCT
Type of Fuel:	06
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	014
Container Num:	14
Year Installed:	1984
Tank Capacity:	00001800
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Visual

Tank Num:	015
Container Num:	15
Year Installed:	1984
Tank Capacity:	00005200
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Visual

Tank Num:	016
Container Num:	16
Year Installed:	Not reported
Tank Capacity:	00000000
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Visual

Tank Num:	017
Container Num:	17
Year Installed:	Not reported
Tank Capacity:	00002000
Tank Used for:	PRODUCT
Type of Fuel:	06
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	018
Container Num:	18
Year Installed:	Not reported

SACRAMENTO LOCOMOTIVE WORKS (Continued) **U001615182**

Tank Capacity:	00000500
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	019
Container Num:	19
Year Installed:	Not reported
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	020
Container Num:	20
Year Installed:	Not reported
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor

Tank Num:	021
Container Num:	21
Year Installed:	Not reported
Tank Capacity:	00001000
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	022
Container Num:	Y-6426
Year Installed:	1968
Tank Capacity:	00001900
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	3/16
Leak Detection:	Visual

Tank Num:	023
Container Num:	Y-6451
Year Installed:	1968
Tank Capacity:	00003600
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Visual

Tank Num:	024
Container Num:	A-6437
Year Installed:	1968
Tank Capacity:	00003600
Tank Used for:	WASTE
Type of Fuel:	Not reported

SACRAMENTO LOCOMOTIVE WORKS (Continued) **U001615182**

Container Construction Thickness:	Not reported
Leak Detection:	Visual
Tank Num:	025
Container Num:	25
Year Installed:	Not reported
Tank Capacity:	00000000
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	026
Container Num:	26
Year Installed:	Not reported
Tank Capacity:	00000800
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	None

J88 **SP, SAC - BATTERY SHOP YARD** **CA HIST Cal-Sites** **S100351390**
SE **401 I STREET** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.032 mi.
167 ft. **Site 7 of 16 in cluster J**

Relative:
Higher

Actual:
24 ft.

Calsite:

Region:	SACRAMENTO
Facility ID:	34360065
Facility Type:	RP
Type:	RESPONSIBLE PARTY
Branch:	CC
Branch Name:	CENTRAL CALIFORNIA
File Name:	Not reported
State Senate District:	06211990
Status:	CERTIFIED AS HAVING BEEN REMEDIED SATISFACTORILY UNDER DTSC OVERSIGHT
Status Name:	CERTIFIED
Lead Agency:	N/A
NPL:	Not Listed
SIC Code:	36
SIC Name:	MANU - ELECTRONIC & OTHER ELECTRIC EQUIP
Access:	Not reported
Cortese:	Not reported
Hazardous Ranking Score:	Not reported
Date Site Hazard Ranked:	Not reported
Groundwater Contamination:	Not reported
Staff Member Responsible for Site:	SGOSS
Supervisor Responsible for Site:	Not reported
Region Water Control Board:	Not reported
Region Water Control Board Name:	Not reported
Lat/Long Direction:	Not reported
Lat/Long (dms):	0 0 0 / 0 0 0
Lat/long Method:	Not reported
Lat/Long Description:	Not reported
State Assembly District Code:	09
State Senate District Code:	06
Facility ID:	34360065

SP, SAC - BATTERY SHOP YARD (Continued) **S100351390**

Activity:	ORDER
Activity Name:	I/SE, IORSE, FFA, FFSRA, VCA, EA
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06021988
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34360065
Activity:	FRA
Activity Name:	FINAL REMEDIAL ACTION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	04251990
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34360065
Activity:	CERT
Activity Name:	CERTIFICATION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06211990
Est Person-Yrs to complete:	0
Estimated Size:	Not reported

SP, SAC - BATTERY SHOP YARD (Continued) **S100351390**

Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	262
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	EXCAVATION AND DISPOSAL OF SOIL AT A CLASS I LANDFILL.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34360065
Activity:	5YEAR
Activity Name:	FIVE-YEAR REVIEW REQUIRED BY CERCLA
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	04091998
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34360065
Activity:	DEED
Activity Name:	DEED RESTRICTIONS
AWP Code:	HWDLU
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06281990
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported

SP, SAC - BATTERY SHOP YARD (Continued) **S100351390**

Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Alternate Address:	401 I STREET
Alternate City,St,Zip:	SACRAMENTO, CA 95814
Background Info:	The Southern Pacific Transportation Company's (SPTCo) Sacramento Railyard Facility has been in operation since 1865. The site is approximately 240 acres. Inorganic and organic contamination are broadly distributed across a majority of the site. Additionally, liquid waste was historically disposed of in an industrial sewer system constructed over 100 years ago. On June 2, 1988, the Department and SPTCo entered into an Enforceable Agreement. A workplan and schedule for investigation and cleanup was finalized in October of 1988. Based on historical usage and known contamination the site was divided into six study areas: Central Shops and, Central Corridor, Car Shops Nine, Lagoon, Northern Shops, and Sacramento Station. The Battery Shop Yard consisted of battery storage building, associated outside storage yard, and dry well in which waste acid was poured. Soil and groundwater contamination is primarily metals.
Comments Date:	01011983
Comments:	This is the date the site was first listed pursuant to
Comments Date:	01011983
Comments:	section 25356.
Comments Date:	04091998
Comments:	5YEAR -- THE 5-YEAR REVIEW FOR THE SOUTHERN PACIFIC TRANSPORTATIO
Comments Date:	04091998
Comments:	COMPANY-SACRAMENTO (SPTCO) BATTERY SHOPS STUDY AREA (BSSA) HAS
Comments Date:	04091998
Comments:	BEEN REVIEWED AND APPROVED BY THE DEPARTMENT. THE REPORT WAS
Comments Date:	04091998
Comments:	COMPLETED AS A TYPE IA REVIEW, AS RECOMMENDED BY DTSC AND CON-
Comments Date:	04091998
Comments:	SISTENT WITH OSWER DIRECTIVE 9355.7-02A. THE IA REVIEWS ARE
Comments Date:	04091998
Comments:	APPLICABLE FOR SITES WHERE CLOSURE IS NOT COMPLETE AND NO SPECIAL
Comments Date:	04091998
Comments:	CIRCUMSTANCES HAVE ARISEN SINCE THE REMEDIAL ACTION WAS PERFORMED
Comments Date:	04091998
Comments:	THE BSSA SOILS WERE EXCAVATED AND DISPOSED OF OFFSITE TO REMEDIAT
Comments Date:	04091998
Comments:	LEAD, CHROMIUM, AND ARSENIC SOIL CONTAMINATION FROM DISPOSAL OF
Comments Date:	04091998
Comments:	SPENT BATTERY ACID INTO ONSITE DRY WELLS. AS PART OF THE APRIL
Comments Date:	04091998
Comments:	1990 FINAL REMEDIAL ACTION PLAN FOR BSSA, SPTCO WAS REQUIRED TO
Comments Date:	04091998
Comments:	INSTALL AND MONITOR 5 GROUNDWATER MONITORING WELLS IN THE UPPERS
Comments Date:	04091998
Comments:	AND ZONE TO EVALUATE THE POTENTIAL SOIL CONTAMINATION FROM THE
Comments Date:	04091998
Comments:	BSSA IMPACTING GROUNDWATER. BASED ON THE REVIEW OF THE GROUND-
Comments Date:	04091998

SP, SAC - BATTERY SHOP YARD (Continued) **S100351390**

Comments:	WATER MONITORING DATA, THE REMEDIATION PERFORMED FOR THE BSSA
Comments Date:	04091998
Comments:	IS MEETING THE OBJECTIVE OF THE BSSA RAP/CP.
Comments Date:	04231990
Comments:	Remedial action begins.
Comments Date:	04251990
Comments:	Remedial action is completed.
Comments Date:	04261990
Comments:	DHS reviews and approves the removal action plan and removal
Comments Date:	04261990
Comments:	and disposal procedures.
Comments Date:	06021988
Comments:	DHS gives Remedial Action Order.
Comments Date:	06211990
Comments:	Certified. Excavation and disposal of 262 tons of soil at
Comments Date:	06211990
Comments:	class I landfill. Cleanup level of 950 mg of lead/kg soil
Comments Date:	06211990
Comments:	was met.
Comments Date:	06221990
Comments:	Deed Restriction: A voluntary deed restriction is in place. This
Comments Date:	06221990
Comments:	property went through the Hazardous Waste/Border Zone Property
Comments Date:	06221990
Comments:	process, but was not formally designated as either a hazardous
Comments Date:	06221990
Comments:	waste property or border zone property.
ID Name:	CALSITES ID NUMBER
ID Value:	34400004
ID Name:	EPA IDENTIFICATION NUMBER
ID Value:	CAD073772030
ID Name:	CALSTARS CODE
ID Value:	100139
Alternate Name:	SOUTHERN PACIFIC TRANSPORTATION COMPANYSP, SAC - BATTERY SHOP YARDSP-SAC - BATTERY SHOPSP-SAC - LOCOMOTIVE WORKSSP-SAC - OVERALL SITESACRAMENTO RAILYARD FACILITYUNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Special Programs Code:	Not reported
Special Programs Name:	Not reported

J89 **AMTRAK DEPOT** **RCRA-LQG** **1010562215**
SE **401 I ST** **CAR000188326**
< 1/8 **SACRAMENTO, CA 95814**
0.032 mi.
167 ft. **Site 8 of 16 in cluster J**

Relative:
Higher

Actual:
24 ft.

RCRA-LQG:

Date form received by agency:	03/01/2014
Facility name:	AMTRAK DEPOT
Facility address:	401 I ST SACRAMENTO, CA 95814
EPA ID:	CAR000188326
Mailing address:	I ST 4TH FLR SACRAMENTO, CA 95814
Contact:	DAN D DRISCOLL
Contact address:	I ST 4TH FLR SACRAMENTO, CA 95814
Contact country:	Not reported

AMTRAK DEPOT (Continued) **1010562215**

Contact telephone: (916) 808-2276
Contact email: DDRISCOLL@CITYOFSACRAMENTO.ORG
EPA Region: 09
Classification: Large Quantity Generator
Description: Handler: generates 1,000 kg or more of hazardous waste during any calendar month; or generates more than 1 kg of acutely hazardous waste during any calendar month; or generates more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month; or generates 1 kg or less of acutely hazardous waste during any calendar month, and accumulates more than 1 kg of acutely hazardous waste at any time; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates more than 100 kg of that material at any time

Owner/Operator Summary:

Owner/operator name: CITY OF SACRAMENTO
Owner/operator address: I ST
SACRAMENTO, CA 95814
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Municipal
Owner/Operator Type: Owner
Owner/Op start date: 01/01/1950
Owner/Op end date: Not reported

Owner/operator name: CITY OF SACRAMENTO
Owner/operator address: I ST
SACRAMENTO, CA 95814
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Municipal
Owner/Operator Type: Operator
Owner/Op start date: 01/01/1950
Owner/Op end date: Not reported

Owner/operator name: CITY OF SACRAMENTO
Owner/operator address: 915 I ST 4TH FLOOR
SACRAMENTO, CA 95814
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Municipal
Owner/Operator Type: Owner
Owner/Op start date: 01/01/2007
Owner/Op end date: Not reported

Owner/operator name: CITY OF SACRAMENTO
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Municipal
Owner/Operator Type: Operator
Owner/Op start date: 01/01/2007
Owner/Op end date: Not reported

AMTRAK DEPOT (Continued) **1010562215**

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D008
. Waste name: LEAD

Historical Generators:
Date form received by agency: 03/24/2009
Site name: AMTRAK DEPOT
Classification: Large Quantity Generator

. Waste code: D008
. Waste name: LEAD

. Waste code: D009
. Waste name: MERCURY

Date form received by agency: 10/30/2007
Site name: AMTRAK DEPOT
Classification: Large Quantity Generator

. Waste code: D008
. Waste name: LEAD

. Waste code: D009
. Waste name: MERCURY

Violation Status: No violations found

J90 **UNION PACIFIC SACRAMENTO YARD** **RCRA-TSDF** **1000409221**
SE **501 JIBBOOM ST** **CERC-NFRAP** **CAD073772030**
< 1/8 **SACRAMENTO, CA 95814** **CORRACTS**
0.032 mi. **RCRA-SQG**
167 ft. **Site 9 of 16 in cluster J** **RAATS**
CA SLIC
Relative: **CA Sacramento Co. CS**
Higher **NY MANIFEST**
CA ENVIROSTOR
Actual: **CA HWP**
24 ft. **2020 COR ACTION**

RCRA-TSDF:
Date form received by agency: 12/03/2001
Facility name: UNION PACIFIC SACRAMENTO YARD

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

Facility address: 501 JIBBOOM ST
SACRAMENTO, CA 95814
EPA ID: CAD073772030
Mailing address: 10031 FOOTHILLS BLVD
ROSEVILLE, CA 95747
Contact: BROCK NELSON
Contact address: 10031 FOOTHILLS BLVD
ROSEVILLE, CA 95747
Contact country: US
Contact telephone: (916) 789-6370
Contact email: Not reported
EPA Region: 09
Land type: Private
Classification: TSDF
Description: Handler is engaged in the treatment, storage or disposal of hazardous waste

Owner/Operator Summary:
Owner/operator name: NAME NOT REPORTED
Owner/operator address: ADDRESS NOT REPORTED
CITY NOT REPORTED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: UNION PACIFIC RAILROAD COMPANY
Owner/operator address: 1416 DODGE ST RM 930
OMAHA, NE 68179
Owner/operator country: Not reported
Owner/operator telephone: (402) 271-5131
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: D001

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: D008
. Waste name: LEAD

Historical Generators:
Date form received by agency: 12/03/2001
Site name: UNION PACIFIC SACRAMENTO YARD
Classification: Small Quantity Generator

Date form received by agency: 09/01/1996
Site name: UNION PACIFIC SACRAMENTO YARD
Classification: Large Quantity Generator

Date form received by agency: 02/25/1994
Site name: SOUTHERN PACIFIC TRANSPORTATION CO
Classification: Large Quantity Generator

Date form received by agency: 02/06/1992
Site name: SOUTHERN PACIFIC TRANSPORTATION
Classification: Large Quantity Generator

Date form received by agency: 06/11/1990
Site name: SOUTHERN PACIFIC TRANSPORTATION CO
Classification: Large Quantity Generator

Corrective Action Summary:
Event date: 02/01/1985
Event: CA049PA

Event date: 09/30/1987
Event: RFA Determination Of Need For An RFI, RFI is Necessary;

Event date: 09/30/1987
Event: RFA Completed

Event date: 09/30/1987
Event: RFA Completed, Assessment was an RFA.

Event date: 06/02/1988
Event: CMS Imposition

Event date: 06/02/1988
Event: RFI Imposition

Event date: 08/08/1988
Event: CA074HI

Event date: 08/08/1988
Event: CA Prioritization, Facility or area was assigned a high corrective action priority.

Event date: 08/08/1988

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

Event: CA049RE

Event date: 08/08/1988
Event: CA029ST

Event date: 01/31/1989
Event: CMS Workplan Approved

Event date: 01/31/1989
Event: RFI Workplan Approved

Event date: 02/28/1989
Event: RFI Approved

Event date: 04/30/1989
Event: CMS Approved

Event date: 08/08/1989
Event: CA049SI

Event date: 12/07/1989
Event: Date For Remedy Selection (CM Imposed)

Event date: 10/18/1991
Event: RFI Workplan Approved

Event date: 12/17/1991
Event: RFI Workplan Approved

Event date: 01/27/1992
Event: RFI Workplan Approved

Event date: 06/30/1992
Event: Corrective Measures Design Approved

Event date: 01/15/1993
Event: Stabilization Measures Implemented, Primary measure is source removal and/or treatment (e.g., soil or waste excavation, in-situ soil treatment, off-site treatment).

Event date: 04/05/1993
Event: Stabilization Construction Completed

Event date: 10/20/1993
Event: Stabilization Measures Implemented, Groundwater extraction and treatment (e.g., to achieve groundwater containment, to achieve MCL).

Event date: 04/25/1994
Event: Stabilization Measures Evaluation,This facility is amenable to stabilization activity based on the status of corrective action work at the facility, technical factors, the degree of risk, timing considerations and administrative considerations.

Event date: 04/25/1994
Event: Stabilization Measures Evaluation,This facility is amenable to stabilization activity based on the status of corrective action work at the facility, technical factors, the degree of risk, timing

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

considerations and administrative considerations.

Event date: 04/25/1994
Event: CA Prioritization, Facility or area was assigned a high corrective action priority.

Event date: 06/21/1994
Event: Certification Of Remedy Completion Or Construction Completion

Event date: 04/06/1998
Event: Igration of Contaminated Groundwater under Control, Yes, Migration of Contaminated Groundwater Under Control has been verified. Based on a review of information contained in the EI determination, it has been determined that migration of contaminated groundwater is under control at the facility. Specifically, this determination indicates that the migration of contaminated groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the existing area of contaminated groundwater. This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

Event date: 04/06/1998
Event: CA Responsibility Referred To A Non-RCRA Federal Authority

Event date: 04/06/1998
Event: Current Human Exposures under Control, Current human exposures are NOT under control.

Event date: 12/13/2000
Event: Igration of Contaminated Groundwater under Control, More information is needed to make a determination.

Event date: 12/13/2000
Event: Current Human Exposures under Control, Current human exposures are NOT under control.

Event date: 01/10/2001
Event: Igration of Contaminated Groundwater under Control, More information is needed to make a determination.

Event date: 01/10/2001
Event: Current Human Exposures under Control, Current human exposures are NOT under control.

Event date: 01/09/2004
Event: Current Human Exposures under Control, Yes, Current Human Exposures Under Control has been verified. Based on a review of information contained in the EI determination, current human exposures are expected to be under control at the facility under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

Event date: 01/09/2004
Event: Current Human Exposures under Control, Yes, Current Human Exposures Under Control has been verified. Based on a review of information contained in the EI determination, current human exposures are

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

expected to be under control at the facility under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

Event date: 10/23/2007
Event: Igration of Contaminated Groundwater under Control, Yes, Migration of Contaminated Groundwater Under Control has been verified. Based on a review of information contained in the EI determination, it has been determined that migration of contaminated groundwater is under control at the facility. Specifically, this determination indicates that the migration of contaminated groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the existing area of contaminated groundwater. This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

Event date: 03/26/2008
Event: Igration of Contaminated Groundwater under Control, Yes, Migration of Contaminated Groundwater Under Control has been verified. Based on a review of information contained in the EI determination, it has been determined that migration of contaminated groundwater is under control at the facility. Specifically, this determination indicates that the migration of contaminated groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the existing area of contaminated groundwater. This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

Event date: Not reported
Event: CA036ST

Event date: Not reported
Event: CA021PC

Facility Has Received Notices of Violations:
Regulation violated: FR - 262.30-34.C
Area of violation: Generators - General
Date violation determined: 11/07/1994
Date achieved compliance: 11/14/1994
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 11/08/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: FR - 264.10-18.B
Area of violation: TSD - General
Date violation determined: 11/07/1994
Date achieved compliance: 11/14/1994
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 11/08/1994

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: FR - 262.50-60
Area of violation: Generators - General
Date violation determined: 11/07/1994
Date achieved compliance: 11/14/1994
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 11/08/1994
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: FR - 264.90-94.F
Area of violation: TSD IS-Ground-Water Monitoring
Date violation determined: 10/21/1991
Date achieved compliance: 07/25/1992
Violation lead agency: State
Enforcement action: INITIAL 3008(A) COMPLIANCE
Enforcement action date: 11/08/1991
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: 125500
Final penalty amount: 70000
Paid penalty amount: Not reported

Regulation violated: FR - 262.10-12.A
Area of violation: Generators - General
Date violation determined: 10/21/1991
Date achieved compliance: 07/25/1992
Violation lead agency: State
Enforcement action: INITIAL 3008(A) COMPLIANCE
Enforcement action date: 11/08/1991
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: 125500
Final penalty amount: 70000
Paid penalty amount: Not reported

Regulation violated: FR - 264.170-177.I
Area of violation: TSD - General
Date violation determined: 10/21/1991
Date achieved compliance: 07/25/1992
Violation lead agency: State
Enforcement action: INITIAL 3008(A) COMPLIANCE
Enforcement action date: 11/08/1991
Enf. disposition status: Not reported

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: 125500
Final penalty amount: 70000
Paid penalty amount: Not reported

Regulation violated: FR - 270
Area of violation: TSD - General
Date violation determined: 03/19/1991
Date achieved compliance: 06/01/1991
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 05/01/1991
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: FR - 270
Area of violation: TSD - General
Date violation determined: 03/12/1990
Date achieved compliance: 06/01/1990
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/26/1990
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: FR - 270
Area of violation: TSD - General
Date violation determined: 01/30/1989
Date achieved compliance: 04/13/1989
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/16/1989
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: FR - 270
Area of violation: TSD - General
Date violation determined: 10/06/1987
Date achieved compliance: 12/28/1987
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 11/16/1987
Enf. disposition status: Not reported
Enf. disp. status date: Not reported

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: F - 264.140-150.H
Area of violation: TSD - Financial Requirements
Date violation determined: 09/19/1986
Date achieved compliance: 12/16/1987
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 09/28/1994
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General
Date achieved compliance: 11/14/1994
Evaluation lead agency: State

Evaluation date: 09/28/1994
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 11/14/1994
Evaluation lead agency: State

Evaluation date: 03/20/1991
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 03/19/1991
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD IS-Ground-Water Monitoring
Date achieved compliance: 07/25/1992
Evaluation lead agency: State

Evaluation date: 03/19/1991
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 07/25/1992
Evaluation lead agency: State

Evaluation date: 03/19/1991
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General
Date achieved compliance: 06/01/1991
Evaluation lead agency: State

Evaluation date: 03/19/1991

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General
Date achieved compliance: 07/25/1992
Evaluation lead agency: State

Evaluation date: 03/12/1990
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General
Date achieved compliance: 06/01/1990
Evaluation lead agency: State

Evaluation date: 03/08/1990
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 01/30/1989
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General
Date achieved compliance: 04/13/1989
Evaluation lead agency: State

Evaluation date: 01/30/1989
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 12/14/1987
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 10/06/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General
Date achieved compliance: 12/28/1987
Evaluation lead agency: State

Evaluation date: 09/19/1986
Evaluation: NON-FINANCIAL RECORD REVIEW
Area of violation: TSD - Financial Requirements
Date achieved compliance: 12/16/1987
Evaluation lead agency: State

CERC-NFRAP:
Site ID: 0901569
Federal Facility: Not a Federal Facility
NPL Status: Not on the NPL
Non NPL Status: NFRAP-Site does not qualify for the NPL based on existing information

CERCLIS-NFRAP Site Contact Details:
Contact Sequence ID: 13287149.00000
Person ID: 13003854.00000

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

Contact Sequence ID: 13292744.00000
Person ID: 13003858.00000

Contact Sequence ID: 13298602.00000
Person ID: 13004003.00000

CERCLIS-NFRAP Site Alias Name(s):
Alias Name: SACRAMENTO LOCOMOTIVE WORKS
Alias Address: Not reported
CA

Alias Name: UNION PACIFIC RR - SACRAMENTO
Alias Address: Not reported
CA

Alias Name: SO PACIFIC
Alias Address: Not reported
CA

Alias Name: SOUTHERN PACIFIC LOCOMOTIVE WORK
Alias Address: Not reported
CA

CERCLIS-NFRAP Assessment History:
Action: DISCOVERY
Date Started: / /
Date Completed: 08/01/80
Priority Level: Not reported

Action: PRELIMINARY ASSESSMENT
Date Started: 05/01/84
Date Completed: 02/01/85
Priority Level: Low priority for further assessment

Action: PRELIMINARY ASSESSMENT
Date Started: / /
Date Completed: 05/01/88
Priority Level: Low priority for further assessment

Action: SITE INSPECTION
Date Started: / /
Date Completed: 08/08/89
Priority Level: NFRAP-Site does not qualify for the NPL based on existing information

Action: ARCHIVE SITE
Date Started: / /
Date Completed: 08/08/89
Priority Level: Not reported

Action: PRELIMINARY ASSESSMENT
Date Started: / /
Date Completed: 08/08/89
Priority Level: NFRAP-Site does not qualify for the NPL based on existing information

CORRACTS:

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

EPA ID: CAD073772030
EPA Region: 09
Area Name: CENTRAL SHOPS AREA
Actual Date: 19930405
Action: CA650 - Stabilization Construction Completed
NAICS Code(s): Not reported
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: SACRAMENTO STATION AREA
Actual Date: 19891207
Action: CA400 - Date For Remedy Selection (CM Imposed)
NAICS Code(s): Not reported
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 20040109
Action: CA725YE - Current Human Exposures Under Control, Yes, Current Human Exposures Under Control has been verified
NAICS Code(s): Not reported
Original schedule date: 20040109
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 20001213
Action: CA725NO - Current Human Exposures Under Control, Current human exposures are NOT under control
NAICS Code(s): Not reported
Original schedule date: 20001213
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 20001213
Action: CA750IN - Migration of Contaminated Groundwater under Control, More information is needed to make a determination
NAICS Code(s): Not reported
Original schedule date: 20001213
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: CENTRAL SHOPS AREA
Actual Date: 19930115
Action: CA600SR - Stabilization Measures Implemented, Primary measure is source removal and/or treatment
NAICS Code(s): Not reported
Original schedule date: Not reported

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: LAGOON/NORTH PLUME AREA
Actual Date: 19911217
Action: CA150 - RFI Workplan Approved
NAICS Code(s): Not reported
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: CENTRAL SHOPS AREA
Actual Date: 19911018
Action: CA150 - RFI Workplan Approved
NAICS Code(s): Not reported
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: SOUTH PLUME AREA
Actual Date: 19931020
Action: CA600GW - Stabilization Measures Implemented, Groundwater extraction and treatment
NAICS Code(s): Not reported
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: SACRAMENTO STATION AREA
Actual Date: 19940621
Action: CA550 - Certification Of Remedy Completion Or Construction Completion
NAICS Code(s): Not reported
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 20071023
Action: CA750YE - Migration of Contaminated Groundwater under Control, Yes, Migration of Contaminated Groundwater Under Control has been verified
NAICS Code(s): Not reported
Original schedule date: 20071023
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 19940425
Action: CA225YE - Stabilization Measures Evaluation, This facility ,is amenable to stabilization activity based on the, status of corrective action work at the facility, technical factors, the degree of risk, timing considerations and administrative considerations

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

NAICS Code(s): Not reported
Original schedule date: 19940425
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: SOUTH PLUME AREA
Actual Date: 19920127
Action: CA150 - RFI Workplan Approved
NAICS Code(s): Not reported
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: SACRAMENTO STATION AREA
Actual Date: 19890228
Action: CA200 - RFI Approved
NAICS Code(s): Not reported
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: SACRAMENTO STATION AREA
Actual Date: 19890430
Action: CA350 - CMS Approved
NAICS Code(s): Not reported
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: SACRAMENTO STATION AREA
Actual Date: 19920630
Action: CA450 - Corrective Measures Design Approved
NAICS Code(s): Not reported
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 19870930
Action: CA070YE - RFA Determination Of Need For An RFI, RFI is Necessary
NAICS Code(s): Not reported
Original schedule date: 19870930
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: ENTIRE FACILITY
Actual Date: 19870930
Action: CA050 - RFA Completed
NAICS Code(s): Not reported
Original schedule date: 19870930
Schedule end date: Not reported

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

EPA ID: CAD073772030
EPA Region: 09
Area Name: SACRAMENTO STATION AREA
Actual Date: 19890131
Action: CA150 - RFI Workplan Approved
NAICS Code(s): Not reported
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAD073772030
EPA Region: 09
Area Name: SACRAMENTO STATION AREA
Actual Date: 19890131
Action: CA300 - CMS Workplan Approved
NAICS Code(s): Not reported
Original schedule date: Not reported
Schedule end date: Not reported

SLIC:
Region: STATE
Facility Status: **Open - Inactive**
Status Date: 08/02/1998
Global Id: SLT5S2473286
Lead Agency: CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number: Not reported
Latitude: 38.571572
Longitude: -121.505908
Case Type: Cleanup Program Site
Case Worker: ZZZ
Local Agency: Not reported
RB Case Number: SLT5S247
File Location: Not reported
Potential Media Affected: Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern: Not reported
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Sacramento Co. CS:
State Site Number: 0379
Lead Staff: Erikson, S.
Lead Agency: HM
Remedial Action Taken: YE, S
Substance: Heater Fuel
Date Reported: 06/04/1991
Facility Id: RO0001105
Case Type: Other ground water affected
Case Closed: Y
Date Closed: **07/21/1997**

NY MANIFEST:
EPA ID: CAD073772030
Country: USA
Location Address 1: 401 I STREET
Location Address 2: Not reported
Location City: SACRAMENTO

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

Location State: CA
Location Zip Code: 95814
Location Zip Code 4: Not reported

Mailing Info:
Name: SOUTHERN PACIFICTRANSPORTATION
Contact: JIM DIEL
Address: 401 I STREET
City/State/Zip: SACRAMENTO, CA 95814
Country: USA
Phone: 916-781-5217

Manifest:

Document ID: NYB2633598
Manifest Status: Completed copy
Trans1 State ID: 10222PNY
Trans2 State ID: Not reported
Generator Ship Date: 01/26/1993
Trans1 Recv Date: 01/26/1993
Trans2 Recv Date: / /
TSD Site Recv Date: 02/09/1993
Part A Recv Date: 02/11/1993
Part B Recv Date: 02/19/1993
Generator EPA ID: CAD073772030
Trans1 EPA ID: NYD980769947
Trans2 EPA ID: Not reported
TSDF ID: NYD000632372
Waste Code: D002 - NON-LISTED CORROSIVE WASTES
Quantity: 00014
Units: P - Pounds
Number of Containers: 001
Container Type: DF - Fiberboard or plastic drums (glass)
Handling Method: T Chemical, physical, or biological treatment.
Specific Gravity: 100
Year: 1993

ENVIROSTOR:
Facility ID: 34720169
Status: Refer: Other Agency
Status Date: 07/21/1995
Site Code: Not reported
Site Type: Historical
Site Type Detailed: * Historical
Acres: Not reported
NPL: NO
Regulatory Agencies: NONE SPECIFIED
Lead Agency: NONE SPECIFIED
Program Manager: Not reported
Supervisor: Referred - Not Assigned
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Not reported

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

Latitude: 38.57157
Longitude: -121.5059
APN: NONE SPECIFIED
Past Use: NONE SPECIFIED
Potential COC: NONE SPECIFIED
Confirmed COC: NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: 34720169
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 01/07/1981
Comments: FACILITY IDENTIFIED INACTIVE #240. FACILITY DRIVE-BY DRIVE-BY-ACTIVE SITE. QUESTIONNAIRE RECEIVED.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 07/21/1995
Comments: Site Screening completed. County provided oversight of investigation and remediation in 1991 & 1992. Refer site to County.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 03/09/1987
Comments: SITE SCREENING DONE.NEED MORE INFORMATION.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

HWP:
EPA Id: CAD073772030
Cleanup Status: CLOSED
Latitude: 38.58348
Longitude: -121.5007
Facility Type: Historical - Non-Operating
Facility Size: Not reported
Team: Not reported
Supervisor: Not reported
Site Code: Not reported
Assembly District: 7
Senate District: 6
Public Information Officer: Not reported

Closure:
EPA Id: CAD073772030
Facility Type: Historical - Non-Operating

UNION PACIFIC SACRAMENTO YARD (Continued) **1000409221**

Unit Names: Drum Storage Area, Industrial Waste Water Treatment
Event Description: Closure - ISSUE CLOSURE VERIFICATION
Actual Date: 08/10/1990

EPA Id: CAD073772030
Facility Type: Historical - Non-Operating
Unit Names: Drum Storage Area
Event Description: Closure - ISSUE CLOSURE VERIFICATION
Actual Date: 09/09/2009

EPA Id: CAD073772030
Facility Type: Historical - Non-Operating
Unit Names: Industrial Waste Water Treatment
Event Description: Closure Final - ISSUE CLOSURE VERIFICATION
Actual Date: 09/09/2009

EPA Id: CAD073772030
Facility Type: Historical - Non-Operating
Unit Names: Drum Storage Area, Industrial Waste Water Treatment
Event Description: Closure - RECEIVE CLOSURE CERTIFICATION
Actual Date: 06/22/1990

Alias:
EPA Id: CAD073772030
Facility Type: Historical - Non-Operating
Alias Type: FRS
Alias: 110012532170

2020 COR ACTION:
EPA ID: CAD073772030
Region: 9
Action: Not reported

J91 **UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S** **CA HIST Cal-Sites** **S105954432**
SE **401 I STREET** **CA CHMIRS** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.032 mi.
167 ft. **Site 10 of 16 in cluster J**

Relative:
Higher

Actual:
24 ft.

Calsite:
Region: SACRAMENTO
Facility ID: 34400004
Facility Type: RP
Type: RESPONSIBLE PARTY
Branch: CC
Branch Name: CENTRAL CALIFORNIA
File Name: Not reported
State Senate District: 01011983
Status: ANNUAL WORKPLAN (AWP) - ACTIVE SITE
Status Name: ANNUAL WORKPLAN - ACTIVE SITE
Lead Agency: DEPT OF TOXIC SUBSTANCES CONTROL
NPL: Not Listed
SIC Code: 40
SIC Name: RAILROAD TRANSPORTATION
Access: Not reported
Cortese: Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Hazardous Ranking Score:	Not reported
Date Site Hazard Ranked:	Not reported
Groundwater Contamination:	Confirmed
Staff Member Responsible for Site:	SGOSS
Supervisor Responsible for Site:	Not reported
Region Water Control Board:	CV
Region Water Control Board Name:	CENTRAL VALLEY
Lat/Long Direction:	Not reported
Lat/Long (dms):	0 0 0 / 0 0 0
Lat/long Method:	Not reported
Lat/Long Description:	Not reported
State Assembly District Code:	09
State Senate District Code:	06
Facility ID:	34400004
Activity:	DISC
Activity Name:	DISCOVERY
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	01071980
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	SI
Activity Name:	SITE INSPECTION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	08271986
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	SS
Activity Name:	SITE SCREENING
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02091987
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	ORDER
Activity Name:	I/SE, IORSE, FFA, FFSRA, VCA, EA
AWP Code:	AGREE
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06021988
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	PPP
Activity Name:	PUBLIC PARTICIPATION PLAN
AWP Code:	Not reported
Proposed Budget:	0

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02281989
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	RA
Activity Name:	REMOVAL ACTION
AWP Code:	FLOAT
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	03081993
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	A SINGLE WELL NONAQUEOUS PHASE REMOVAL SYSTEM HAS BEEN INSTALLED ANDIS OPERATING. APPROX. 5 GALLONS IS REMOVED PER WEEK.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	GWRA
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	04271995
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	RAW
Activity Name:	REMOVAL ACTION WORKPLAN
AWP Code:	GWRA
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	04271995
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	RA
Activity Name:	REMOVAL ACTION
AWP Code:	OFFGW
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05121995
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	GROUNDWATER EXTRACTION SYSTEM IS DESIGNED TO HAVE A MAXIMUM VOCDISCHARGE CONCENTRATION OF 50 PPB AND MIXIMUM EXTRACTION RATE OF240 GPM.

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	RA
Activity Name:	REMOVAL ACTION
AWP Code:	ONGW
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	08081995
Est Person-Yrs to complete:	0.41000
Estimated Size:	M
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	CONSISTS OF GW EXTRACTION SYSTEM, SOIL VAPOR EXTRACTION SYSTEM,AND GW/SOIL VAPOR TREATMENT SYSTEM LOCATED WITHN THE CENTRALCORRIDOR STUDY AREA.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	RIFS
Activity Name:	REMEDIAL INVESTIGATION / FEASIBILITY STUDY
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	04302005
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0.46000
Estimated Size:	X
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	12302005
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	X
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	DES
Activity Name:	DESIGN
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	07302006
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	X
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	RMDL
Activity Name:	REMEDIAL ACTION (RAP REQUIRED)
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	12302007
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	X
Request to Delete Activity:	Not reported
Activity Status:	AWP

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	CERT
Activity Name:	CERTIFICATION
AWP Code:	OFFGW
Proposed Budget:	0
AWP Completion Date:	12302010
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	X
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	OM
Activity Name:	OPERATION & MAINTENANCE
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	06302033
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	NOD
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	ACP
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	NOE
Proposed Budget:	0
AWP Completion Date:	Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400004
Activity:	RAW
Activity Name:	REMOVAL ACTION WORKPLAN
AWP Code:	SOIL
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Alternate Address:	401 I STREET
Alternate City,St,Zip:	SACRAMENTO, CA 95814
Background Info:	The Southern Pacific Transportation Company's (SPTCo) Sacramento Railyard Facility has been in operation since 1865. The site is approximately 240 acres. Inorganic and organic contamination are broadly distributed across a majority of the site. Additionally, liquid waste was historically disposed of in an industrial sewer system constructed over 100 years ago. On June 2, 1988, the Department and SPTCo entered into an Enforceable Agreement. A workplan and schedule for investigation and cleanup was finalized in October of 1988. Based on historical usage and known contamination the site was divided into six study areas: Central Shops and, Central Corridor, Car Shops Nine, Lagoon, Northern Shops, and Sacramento Station.

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

The Central Shops were used to construct, repair, and maintain locomotives. Results of three soil remedial investigation phases have shown extensive soil and groundwater contamination. Soil contamination includes metals, Volatile Organic Compounds (VOC's), Semi Volatile Organic Compounds (SVOC's), Poly Nuclear Aromatics (PAH's), and Total Petroleum Hydrocarbons (TPH). The groundwater contamination extends south, off-site, to P Street. Off-site groundwater contaminants are primarily chlorinated solvents.

Comments Date: 05072003
Comments: Rail Yard. This plan would result in soil cleanup along with a
Comments Date: 05072003
Comments: proposed new rail line corridor prior to moving the freight
Comments Date: 05072003
Comments: track. DTSC prepared an Initial Study Agency Checklist which
Comments Date: 05072003
Comments: relies on the City of Sacramento EIRs prepared for redevelopment
Comments Date: 02091987
Comments: Site Screening is completed.
Comments Date: 03011984
Comments: Preliminary Assessment: Central Valley RWQCB (12/17/81) -
Comments Date: 03011984
Comments: operations are locomotive maintenance, engine building/
Comments Date: 03011984
Comments: rebuilding, forging, metal painting, battery machining,
Comments Date: 03011984
Comments: wheel brake, & fabrication. In operation since 1863.
Comments Date: 03011984
Comments: 100-year flood plain.
Comments Date: 04271995
Comments: California Environmental Quality Act (CEQA) Ground Water Removal
Comments Date: 04271995
Comments: Action (GWRA) -- The DTSC has approved the final California
Comments Date: 04271995
Comments: CEQA package for vertical and horizontal containment of an
Comments Date: 04271995
Comments: off-site groundwater plume emanating from the SPTCo-Sacramento
Comments Date: 04271995
Comments: Rail Yard off-site to the south, the South Plume. The CEQA
Comments Date: 04271995
Comments: package project is implementation of two Interim Remedial
Comments Date: 04271995
Comments: Measures (IRMs), the South Plume Source Control and the South
Comments Date: 04271995
Comments: Plume Margin Control.
Comments Date: 04271995
Comments: Not reported
Comments Date: 04271995
Comments: The South Plume Margin Control consists of a groundwater
Comments Date: 04271995
Comments: extraction system located on P Street in Sacramento for
Comments Date: 04271995
Comments: leading edge capture. The South Plume Source Control consists
Comments Date: 04271995
Comments: of a groundwater/soil vapor extraction and treatment system
Comments Date: 04271995
Comments: located within the SPTCo-Sacramento Rail Yard to capture

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments Date:	04271995
Comments:	identified sources.
Comments Date:	04271995
Comments:	Not reported
Comments Date:	04271995
Comments:	Removal Action Work Plan (RAW) Groundwater Removal Action
Comments Date:	04271995
Comments:	(GWRA) -- A Removal Action Workplan was approved for two
Comments Date:	04271995
Comments:	South Plume Margin Control. The South Plume Margin Control
Comments Date:	04271995
Comments:	consists of a groundwater extraction system located on P
Comments Date:	04271995
Comments:	Street in Sacramento. The South Plume Source Control is
Comments Date:	04271995
Comments:	comprised of a groundwater/soil vapor extraction and
Comments Date:	04271995
Comments:	treatment system located within the Central Shops Study
Comments Date:	04271995
Comments:	area of the SPTCo-Sacramento Rail Yard. The Interim Remedial
Comments Date:	04271995
Comments:	Measures (IRMs) are being implemented to control the lateral
Comments Date:	04271995
Comments:	and veritcal migration of groundwater contaminated with
Comments Date:	04271995
Comments:	volatile organic compounds. The groundwater extraction system
Comments Date:	04271995
Comments:	became operational on May 12, 2001.
Comments Date:	05072003
Comments:	CEQA/NOD-- A Notice of Determination (NOD) was approved for
Comments Date:	05072003
Comments:	actions selected under a Removal Action Workplan prepared for
Comments Date:	05072003
Comments:	soil cleanup in six acres of the Central Shops Study Area of the
Comments Date:	05072003
Comments:	projects which includes the Railyard. The NOD and supporting
Comments Date:	05072003
Comments:	evaluations were made available for public review for 30 days
Comments Date:	05072003
Comments:	from 2/25/03 to 3/27/03 and was presented at the 3/11/03 public
Comments Date:	05072003
Comments:	meeting held at the Sacramento Amtrak Depot. A notice was
Comments Date:	05072003
Comments:	displayed in the Sacramento Bee newspaper and a fact sheet was
Comments Date:	05072003
Comments:	mailed to the site mailing list to provide information and
Comments Date:	05072003
Comments:	announce the review period and a public meeting.
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP)
Comments Date:	05072003
Comments:	prepared to amend the February 2000 Final Amended Industrial
Comments Date:	05072003
Comments:	Wastewater Lagoon RAP, and February 2000 Final Central Corridor,
Comments Date:	05072003

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments:	Car Shop Nine and Northern Shops RAP for Soil. The ACP
Comments Date:	05072003
Comments:	establishes the process to identify the presence of and safety
Comments Date:	05072003
Comments:	clean up of asbestos if found during future soil excavation.
Comments Date:	05072003
Comments:	In compliance with CEQA, DTSC has prepared a notice of
Comments Date:	05072003
Comments:	exemption. A comment period for the project was held from
Comments Date:	05072003
Comments:	February 25 through March 27, 2003. A public meeting was held on
Comments Date:	05072003
Comments:	March 11, 2003. Public comments were received by DTSC and
Comments Date:	05072003
Comments:	addressed through a responsiveness summary.
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an
Comments Date:	05072003
Comments:	Asbestos Contingency Plan (ACP) prepared to amend the February
Comments Date:	05072003
Comments:	2000 Final Amended Industrial Wastewater Lagoon RAP, and
Comments Date:	05072003
Comments:	February 2000 Final Central Corridor, Car Shop Nine, and Northern
Comments Date:	05072003
Comments:	Shops RAP for Soil. The ACP establishes the process to identify
Comments Date:	05072003
Comments:	the presence of and safely clean up asbestos if found during
Comments Date:	05072003
Comments:	future soil excavation. A comment period for the project was
Comments Date:	05072003
Comments:	held from 2/25/03 to 3/27/03. A public meeting was held on
Comments Date:	05072003
Comments:	3/11/03. Public comments were received by DTSC and addressed
Comments Date:	05072003
Comments:	through a responsiveness summary.
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	RAW/SOIL--DTSC approved a Removal Action Workplan (RAW) for soil
Comments Date:	05072003
Comments:	cleanup in six acres of the Central Shops Study Area of the Rail
Comments Date:	05072003
Comments:	Yard. This plan would result in soil cleanup along a proposed
Comments Date:	05072003
Comments:	new rail line corridor prior to moving the freight track. In
Comments Date:	05072003
Comments:	compliance with CEQA, DTSC has prepared a notice of
Comments Date:	05072003
Comments:	determination. A comment period for the project was held from
Comments Date:	05072003
Comments:	February 25 through March 27, 2003. A public meeting was held on
Comments Date:	05072003
Comments:	March 11, 2003. Public comment were received by DTSC and
Comments Date:	05072003
Comments:	addressed through a responsiveness summary.

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments Date:	06302005
Comments:	RA (REMEDIAL ACTION). SOIL REMEDIATION ACTIVITIES THAT MET THE
Comments Date:	06302005
Comments:	INDUSTRIAL COMMERCIAL REMEDIAL ACTION OBJECTIVES WERE COMPLETED
Comments Date:	06302005
Comments:	WITHIN A 4.25 ACRE MAIN FREIGHT LINE RELOCATION AREA WITHIN THE
Comments Date:	06302005
Comments:	SOUTHERN PORTION OF THE UNION PACIFIC RAILROAD COMPANY(UPRR)
Comments Date:	06302005
Comments:	SACRAMENTO RAIL YARD CENTRAL SHOPS AREA. THE MAIN FREIGHT LINE
Comments Date:	06302005
Comments:	RELOCATION AREA HAS BEEN DEFINED BY THE SACRAMENTO STATION
Comments Date:	06302005
Comments:	BOUNDARY ON THE SOUTH AND AN EAST-WEST TRENDING LINE 25 FEET
Comments Date:	06302005
Comments:	SOUTH OF THE ERECTING SHOP. APPROXIMATELY 3,148 CUBIC YARDS OF
Comments Date:	06302005
Comments:	SOIL WAS EXCAVATED AND PROFILED FOR UNRESTRICTED ONSITE REUSE,
Comments Date:	06302005
Comments:	LANDFARMING/UNRESTRICTED ONSITE REUSE OR OFFSITE DISPOSAL IN
Comments Date:	06302005
Comments:	ACCORDANCE WITH THE FINAL CENTRAL SHOPS SOIL REMOVAL ACTION WORK
Comments Date:	06302005
Comments:	PLAN (RAW; ERM, MAY 22, 2003) AND THE FINAL REMEDIAL DESIGN AND
Comments Date:	06302005
Comments:	IMPLEMENTATION PLAN (RDIP; JULY 19, 2001).
Comments Date:	08261992
Comments:	Removal Action (FLOAT) - a single well nonaqueous phase removal
Comments Date:	08261992
Comments:	system has been installed and is operating. The system is used
Comments Date:	08261992
Comments:	to remove a layer of oily liquid floating on top of the ground
Comments Date:	08261992
Comments:	water. The removed material is pumped out of the well and
Comments Date:	08261992
Comments:	stored in an above-ground tank. The material is periodicly
Comments Date:	08261992
Comments:	removed from the tank and transported to a solvent recycling
Comments Date:	08261992
Comments:	facility for treatment. This is an ongoing activity and
Comments Date:	08261992
Comments:	will continue as long as the material is present. The
Comments Date:	08261992
Comments:	floating material is composed of oil, chlorinated and non-
Comments Date:	08261992
Comments:	chlorinated volatile organic compounds, methylnaphthalene
Comments Date:	08261992
Comments:	and naphthalene. Approx. five gallong is removed per week.
Comments Date:	08261992
Comments:	Cost of system, operation and treatment/disposal is
Comments Date:	08261992
Comments:	estimated to be $20,000 for FY 93/94. This is an RP funded
Comments Date:	08261992
Comments:	activity.
ID Name:	EPA IDENTIFICATION NUMBER
ID Value:	CAD073772030
ID Name:	CALSITES ID NUMBER

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

ID Value: 34400010
ID Name: BEP DATABASE PCODE
ID Value: P11077
ID Name: CALSTARS CODE
ID Value: 100139
Alternate Name: SOUTHERN PACIFIC TRANSPORTATION COSACRAMENTO RAILYARD FACILITYSP, SAC - CENTRAL SHOPUNION PACIFIC RAILROAD-SACRAMENTO RAILYDUP, DOWNTOWN SAC - CENTRAL SHOPSSP-SAC - OVERALL SITESP-SAC - LOCOMOTIVE WORKS
Special Programs Code: R3012
Special Programs Name: RCRA 3012

Region: SACRAMENTO
Facility ID: 34400005
Facility Type: RP
Type: RESPONSIBLE PARTY
Branch: CC
Branch Name: CENTRAL CALIFORNIA
File Name: Not reported
State Senate District: 01121996
Status: CERTIFIED OPERATION AND MAINTENANCE, ALL PLANNED ACTIVITIES IMPLEMENTED, REMEDIATION CONTINUES
Status Name: CERTIFIED / OPERATION & MAINTENANCE
Lead Agency: DEPT OF TOXIC SUBSTANCES CONTROL
NPL: Not Listed
SIC Code: 40
SIC Name: RAILROAD TRANSPORTATION
Access: Not reported
Cortese: Not reported
Hazardous Ranking Score: Not reported
Date Site Hazard Ranked: Not reported
Groundwater Contamination: Confirmed
Staff Member Responsible for Site: SGOSS
Supervisor Responsible for Site: Not reported
Region Water Control Board: Not reported
Region Water Control Board Name: Not reported
Lat/Long Direction: Not reported
Lat/Long (dms): 0 0 0 / 0 0 0
Lat/long Method: Not reported
Lat/Long Description: Not reported
State Assembly District Code: 09
State Senate District Code: 06
Facility ID: 34400005
Activity: ORDER
Activity Name: I/SE, IORSE, FFA, FFSRA, VCA, EA
AWP Code: Not reported
Proposed Budget: 0
AWP Completion Date: Not reported
Revised Due Date: Not reported
Comments Date: 04191984
Est Person-Yrs to complete: 0
Estimated Size: Not reported
Request to Delete Activity: Not reported
Activity Status: COM
Definition of Status: CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals): 0
Liquids Treated (Gals): 0
Action Included Capping: Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	RA
Activity Name:	REMOVAL ACTION
AWP Code:	SOIL
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	07311985
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	ORDER
Activity Name:	I/SE, IORSE, FFA, FFSRA, VCA, EA
AWP Code:	AGREE
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	07281987
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Activity:	RIFS
Activity Name:	REMEDIAL INVESTIGATION / FEASIBILITY STUDY
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	12311987
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	PPP
Activity Name:	PUBLIC PARTICIPATION PLAN
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02281989
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06301989
Est Person-Yrs to complete:	0
Estimated Size:	Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	DES
Activity Name:	DESIGN
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	03301990
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	RA
Activity Name:	REMOVAL ACTION
AWP Code:	OVFLW
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06201991
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	1880
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Activity Comments:	1880 CU YDS OF CONTAMINATED SOIL EXCAVATED FROM AN OVERFLOW AREAADJACENT TO AN OIL-WATER SEPARATOR AT THE POND & DITCH SITE.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	RA
Activity Name:	REMOVAL ACTION
AWP Code:	OILPD
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06271991
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	800
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	OIL POND REMOVAL
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	RMDL
Activity Name:	REMEDIAL ACTION (RAP REQUIRED)
AWP Code:	PDGW1
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	10291992
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	RMDL
Activity Name:	REMEDIAL ACTION (RAP REQUIRED)

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

AWP Code:	SOIL
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05301993
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	11000
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	EXCAVATION OF CONTAMINATED SOILS. DISPOSAL OF METALS AND ORGANICCONTAMINATED SOIL TO CONTROLLED LANDFILL.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	FRIFS
Activity Name:	FOCUSED REMEDIAL INVESTIGATION/FEASIBILITY STUDY
AWP Code:	GW2
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	01051994
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	DEED
Activity Name:	DEED RESTRICTIONS
AWP Code:	RESTR
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05191994
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	DES
Activity Name:	DESIGN
AWP Code:	GW2
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06231994
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	OM
Activity Name:	OPERATION & MAINTENANCE
AWP Code:	AGMT
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06301994
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	RMDL
Activity Name:	REMEDIAL ACTION (RAP REQUIRED)
AWP Code:	GW2
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	04281995
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	COMPLETED MODIFIED GROUNDWATER EXTRACTION SYSTEM FROM 5 TO 7 WELLS.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	CERT
Activity Name:	CERTIFICATION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	01121996
Est Person-Yrs to complete:	0
Estimated Size:	L
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	11000
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	EXCAVATION OF CONTAMINATED SOILS. DISPOSAL OF METALS AND ORGANICCONTAMINATED SOIL TO CONTROLLED LANDFILL.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	OM
Activity Name:	OPERATION & MAINTENANCE
AWP Code:	Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Proposed Budget:	0
AWP Completion Date:	01012031
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	ACP
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400005
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	NOE
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	COM
Definition of Status:	CERTIFIED / OPERATION & MAINTENANCE

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Alternate Address:	401 I STREET
Alternate City,St,Zip:	SACRAMENTO, CA 95814
Background Info:	The Southern Pacific Transportation Company's (SPTCo) Sacramento Railyard Facility has been in operation since 1865. The site is approximately 240 acres. Inorganic and organic contamination are broadly distributed across a majority of the site. Additionally, liquid waste was historically disposed of in an industrial sewer system constructed over 100 years ago. On June 2, 1988, the Department and SPTCo entered into an Enforceable Agreement. A workplan and schedule for investigation and cleanup was finalized in October of 1988. Based on historical usage and known contamination the site was divided into six study areas: Central Shops and, Central Corridor, Car Shops Nine, Lagoon, Northern Shops, and Sacramento Station. The Ponds and Ditch consisted of the industrial wastewater disposal ponds and a ditch to convey wastewater to the Sacramento regional sewer system. Soils contaminated with metals, Volatile Organic Compounds (VOC's), Semi Volatile Organic Compounds (SVOC's), and Poly Nuclear Aromatics (PAH's) were remediated in May 1993. Groundwater contamination includes metals, and VOC's.
Comments Date:	04281995
Comments:	original five well extraction system selected as the
Comments Date:	04281995
Comments:	remedial alternative was modified to be a seven well
Comments Date:	04281995
Comments:	extraction and treatment system after total Volatile
Comments Date:	04281995
Comments:	Organic Compound (VOC) discharge levels exceeded the 100 par
Comments Date:	01051994
Comments:	FRI/FS -- FOURTEEN GROUND WATER SAMPLES WERE COLLECTED DOWN
Comments Date:	01051994
Comments:	GRADIENT, AT THE ESTIMATED MARGIN OF THE UPPER SAND ZONE
Comments Date:	01051994
Comments:	GROUNDWATER PLUME. RESULTS FROM THE SAMPLING INDICATE THAT
Comments Date:	01051994
Comments:	THE PLUME MARGIN IS WITHIN THE ESTIMATED MARGIN, COMPLETING
Comments Date:	01051994
Comments:	CHARACTERIZATION AND ALLOWING TREATMENT BY THE EXISTING,
Comments Date:	01051994
Comments:	MODIFIED GROUND WATER EXTRACTION SYSTEM. APPROX. COST OF
Comments Date:	01051994
Comments:	THIS SAMPLING WAS $50,000 WHICH WAS PAID FOR BY THE RP.
Comments Date:	01121996
Comments:	CERT - THE SITE HAS BEEN CERTIFIED FOR SOIL REMEDIAL ACTIVI-
Comments Date:	01121996

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments:	TIES AND GROUNDWATER EXTRACTION AND TREATMENT AS REQUIRED BY
Comments Date:	01121996
Comments:	THE MODIFIED FINAL RAP. A DEED RESTRICTION HAS BEEN RECORDE
Comments Date:	01121996
Comments:	WITH SACRAMENTO COUNTY WHICH LIMITS LAND USE TO COMMERCIAL
Comments Date:	01121996
Comments:	AND INDUSTRIAL.
Comments Date:	01121996
Comments:	11,000 CUBIC YARD REMEDIATED, 0.1653 ACRES OF LAND RETURNED/
Comments Date:	01121996
Comments:	RELEASED FOR REUSE, GROUNDWATER REMEDIATION EXTRACTION RATE
Comments Date:	01121996
Comments:	(GPD) 353,520
Comments Date:	04281995
Comments:	RMDL (GW2) -- The Ponds and Ditch Study Area (PDSA)
Comments Date:	04281995
Comments:	groundwater extraction system has been modified and
Comments Date:	04281995
Comments:	implemented to meet the requirements of the Remedial Action
Comments Date:	04281995
Comments:	Plan and Closure Plan (RAP) for the Southern Pacific
Comments Date:	04281995
Comments:	Transportation Company-Sacramento, Rail Yard PDSA. The
Comments Date:	04281995
Comments:	per billion (ppb) total VOC level required for extraction
Comments Date:	04281995
Comments:	and discharge into the Sacramento City sewer system. An
Comments Date:	04281995
Comments:	original groundwater extraction well, exw-4, was identified
Comments Date:	04281995
Comments:	as the primary source of VOC's. To address this, SPTCo
Comments Date:	04281995
Comments:	installed two additional groundwater extraction wells,
Comments Date:	04281995
Comments:	exw-6 and exw-7, and connected exw-4, exw-6 and exw-7 to
Comments Date:	04281995
Comments:	the existing Drum Storage Area soil vapor/groundwater
Comments Date:	04281995
Comments:	extraction system for treatment prior to discharge. The
Comments Date:	04281995
Comments:	original PDSA groundwater extraction system was in operation
Comments Date:	04281995
Comments:	on November 5, 1992. The complete, modified groundwater
Comments Date:	04281995
Comments:	extraction system has been in operation since Aug. 15, 1994.
Comments Date:	05072003
Comments:	RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP)
Comments Date:	05072003
Comments:	prepared to amend the February 2000 Final Amended Industrial
Comments Date:	05072003
Comments:	Wastewater Lagoon RAP, and February 2000 Final Central Corridor,
Comments Date:	05072003
Comments:	Car Shop Nine and Northern Shops RAP for Soil. The ACP
Comments Date:	05072003
Comments:	establishes the process to identify the presence of and safety
Comments Date:	05072003
Comments:	clean up of asbestos if found during future soil excavation.

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments Date:	05072003
Comments:	In compliance with CEQA, DTSC has prepared a notice of
Comments Date:	05072003
Comments:	exemption. A comment period for the project was held from
Comments Date:	05072003
Comments:	February 25 through March 27, 2003. A public meeting was held on
Comments Date:	05072003
Comments:	March 11, 2003. Public comments were received by DTSC and
Comments Date:	05072003
Comments:	addressed through a responsiveness summary.
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an
Comments Date:	05072003
Comments:	Asbestos Contingency Plan (ACP) prepared to amend the February
Comments Date:	05072003
Comments:	2000 Final Amended Industrial Wastewater Lagoon RAP, and
Comments Date:	05072003
Comments:	February 2000 Final Central Corridor, Car Shop Nine, and Northern
Comments Date:	05072003
Comments:	Shops RAP for Soil. The ACP establishes the process to identify
Comments Date:	05072003
Comments:	the presence of and safely clean up asbestos if found during
Comments Date:	05072003
Comments:	future soil excavation. A comment period for the project was
Comments Date:	05072003
Comments:	held from 2/25/03 to 3/27/03. A public meeting was held on
Comments Date:	05072003
Comments:	3/11/03. Public comments were received by DTSC and addressed
Comments Date:	05072003
Comments:	through a responsiveness summary.
Comments Date:	05301993
Comments:	FRA (SOIL) -- This final remedial action consisted of back-
Comments Date:	05301993
Comments:	filling and compaction of an excavation with 11,000 cubic
Comments Date:	05301993
Comments:	yards of imported clean fill and was completed May 30, 1993.
Comments Date:	05301993
Comments:	In order to meet the RCRA Closure requirements for this
Comments Date:	05301993
Comments:	unit, prior to backfilling an area of excavation, a post-
Comments Date:	05301993
Comments:	remediation health risk assessment was required. The
Comments Date:	05301993
Comments:	recently approved assessment has shown the site will not
Comments Date:	05301993
Comments:	pose unacceptable risks, therefore allowing backfill of
Comments Date:	05301993
Comments:	the excavation. Approx cost = $110,000 (RP funded)
Comments Date:	06011994
Comments:	DEED RESTRICTION -- A deed restriction has been negotiated
Comments Date:	06011994
Comments:	recorded which limits land use to commercial and industrial
Comments Date:	06011994
Comments:	land use. .17 acres of land returned for reuse.
Comments Date:	06231994

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments:	DESIGN -- the Department approved SPTCo's Modified Pond &
Comments Date:	06231994
Comments:	Ditch Extraction system: Final Design Report. The Final
Comments Date:	06231994
Comments:	Design Report provides detailed plumbing and electrical
Comments Date:	06231994
Comments:	plans and provides discharge requirements from the City of
Comments Date:	06231994
Comments:	Sacramento and treatment requirements from the County of
Comments Date:	06231994
Comments:	Sacramento.
Comments Date:	06301991
Comments:	Removal Action: Oil pond removal.
Comments Date:	06301994
Comments:	ORDER -- the Department, after extensive efforts to
Comments Date:	06301994
Comments:	negotiate an agreement with SPTCo, issued an Order to SPTCo
Comments Date:	06301994
Comments:	for Operation and Maintenance of a groundwater extraction
Comments Date:	06301994
Comments:	system at the Pond and Ditch site.
Comments Date:	07251991
Comments:	Wastewater disposal pond/ditch. Contaminants include Pb,
Comments Date:	07251991
Comments:	toluene, TCE, PCE, 1,1-DCA, xylene, benzene, 1,1,1-TCA, and
Comments Date:	07251991
Comments:	PAH. Groundwater contaminated with Ni, TCE, Cr, 1,2-DCE,
Comments Date:	07251991
Comments:	and methylene chloride.
Comments Date:	07311985
Comments:	Removal Action: Pond - soil/sludge removal.
Comments Date:	10291992
Comments:	FRA (GW1) -- A 5-well ground water extraction system was
Comments Date:	10291992
Comments:	started up at the site. The system initially withdrew
Comments Date:	10291992
Comments:	250 gpm of water impacted by chlorinated solvents. The
Comments Date:	10291992
Comments:	system evaluation conducted since the start-up has shown
Comments Date:	10291992
Comments:	that augmentation will be required with at least two
Comments Date:	10291992
Comments:	additional extraction wells and predischarge treatment to
Comments Date:	10291992
Comments:	reduce contaminant concentrations to levels acceptable
Comments Date:	10291992
Comments:	for discharge to the city of Sacramento sewer system for
Comments Date:	10291992
Comments:	treatment at the publicly owned treatment works. Approx.
Comments Date:	10291992
Comments:	110,000,000 gallons pumped & treated this FY. Approx.
Comments Date:	10291992
Comments:	cost = $250,000 (RP funded)
Comments Date:	10291992
Comments:	Not reported
Comments Date:	10311990
Comments:	Removal Action: Approximately 1880 cubic yards of contami-

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments Date: 10311990
Comments: nated soil was excavated from an overflow area adjacent to
Comments Date: 10311990
Comments: an oil-water separator at the Pond and Ditch site. The soil
Comments Date: 10311990
Comments: was disposed of at a Class I landfill. Soil contaminants
Comments Date: 10311990
Comments: included chlorinated solvents, TPH, and metals.
ID Name: CALSITES ID NUMBER
ID Value: 34400004
ID Name: EPA IDENTIFICATION NUMBER
ID Value: CAD073772030
ID Name: BEP DATABASE PCODE
ID Value: P14029
ID Name: CALSTARS CODE
ID Value: 100139
Alternate Name: SOUTHERN PACIFIC TRANSPORTATION COSP, SAC - PONDS AND DITCHSP-SAC - PONDS AND DITCHSP-SAC - LOCOMOTIVE WORKSSP-SAC - OVERALL SITESACRAMENTO RAILYARD FACILITYUNION PACIFIC RAILROAD-SACRAMENTO RAILYDUP, DOWNTOWN SAC - PONDS AND DITCH
Special Programs Code: R3012
Special Programs Name: RCRA 3012

Region: SACRAMENTO
Facility ID: 34400007
Facility Type: RP
Type: RESPONSIBLE PARTY
Branch: CC
Branch Name: CENTRAL CALIFORNIA
File Name: UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S
State Senate District: 01011990
Status: ANNUAL WORKPLAN (AWP) - ACTIVE SITE
Status Name: ANNUAL WORKPLAN - ACTIVE SITE
Lead Agency: DEPT OF TOXIC SUBSTANCES CONTROL
NPL: Not Listed
SIC Code: 40
SIC Name: RAILROAD TRANSPORTATION
Access: Not reported
Cortese: Not reported
Hazardous Ranking Score: Not reported
Date Site Hazard Ranked: Not reported
Groundwater Contamination: Confirmed
Staff Member Responsible for Site: SGOSS
Supervisor Responsible for Site: Not reported
Region Water Control Board: Not reported
Region Water Control Board Name: Not reported
Lat/Long Direction: Not reported
Lat/Long (dms): 0 0 0 / 0 0 0
Lat/long Method: Not reported
Lat/Long Description: Not reported
State Assembly District Code: 09
State Senate District Code: 06
Facility ID: 34400007
Activity: ORDER
Activity Name: I/SE, IORSE, FFA, FFSRA, VCA, EA
AWP Code: Not reported
Proposed Budget: 0

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	07301987
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	PPP
Activity Name:	PUBLIC PARTICIPATION PLAN
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02281989
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	RA
Activity Name:	REMOVAL ACTION
AWP Code:	SOIL
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06081990
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	432

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	EXCAVATED AND TRANSPORTED UNDER MANIFEST TO A CLASS I LANDFILL INIDAHO.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	RIFS
Activity Name:	REMEDIAL INVESTIGATION / FEASIBILITY STUDY
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	01071992
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	DRUM
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06301992
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	DES
Activity Name:	DESIGN
AWP Code:	DSGW1
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	03091994
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	DES
Activity Name:	DESIGN
AWP Code:	DSVS1
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	03091994
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	FRA
Activity Name:	FINAL REMEDIAL ACTION
AWP Code:	DSGW
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments Date:	09151994
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	FRA
Activity Name:	FINAL REMEDIAL ACTION
AWP Code:	DSVS1
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	09151994
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	RMDL
Activity Name:	REMEDIAL ACTION (RAP REQUIRED)
AWP Code:	DSGW
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	09151994
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	GROUNDWATER EXTRACTION AND SOIL VAPOR TREATMENT SYSTEMS CONSTRUCTED.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	RMDL
Activity Name:	REMEDIAL ACTION (RAP REQUIRED)
AWP Code:	DSVS1
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	09151994
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	GROUNDWATER EXTRACTION AND SOIL VAPOR TREATMENT SYSTEMS CONSTRUCTED.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	RIFS
Activity Name:	REMEDIAL INVESTIGATION / FEASIBILITY STUDY
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	12311998
Est Person-Yrs to complete:	0
Estimated Size:	M
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02162000
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	DES
Activity Name:	DESIGN
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05222000
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	RMDL
Activity Name:	REMEDIAL ACTION (RAP REQUIRED)
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	10302006
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	CERT
Activity Name:	CERTIFICATION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	09302010
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	OM
Activity Name:	OPERATION & MAINTENANCE
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	09302032
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	ORDER
Activity Name:	I/SE, IORSE, FFA, FFSRA, VCA, EA
AWP Code:	DSO&M
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	07081996
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	NOD
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02162000
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	ACP

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400007
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	NOE
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Alternate Address:	401 I STREET
Alternate City,St,Zip:	SACRAMENTO, CA 95814
Background Info:	The Southern Pacific Transportation Company's (SPTCo) Sacramento Railyard Facility has been in operation since 1865. The site is approximately 240 acres. Inorganic and organic contamination are broadly distributed across a majority of the site. Additionally, liquid waste was historically disposed of in an industrial sewer system constructed over 100 years ago. On June 2, 1988, the Department and SPTCo entered into an Enforceable Agreement. A workplan and schedule for investigation and cleanup was finalized in October of 1988. Based on historical usage and known contamination the site was divided into six study areas: Central Shops (CSSA), Central

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Corridor (CCSA), Car Shop (CSNSA), and Sacramento Station (SSSA). The Northern Shops Study Area consisted of storage buildings, a Frog Shop, Spring shop, Brass Foundry and a Drum Storage Area (a seperate RCRA unit) were unknown types and amounts of chemical were disposed of and stored on the ground. Soil contamination includes metals, Volatile Organic Compounds (VOC's), Semi Volatile Organic Compounds (SVOC's) including Poly Nuclear Aromatics (PAH's), and Total Petroleum Hydrocarbons (TPH). Groundwater contamination includes metals, VOC's, SVOC's, and TPH.

Comments Date: 01011990
Comments: This is the date the site was first listed pursuant to
Comments Date: 01011990
Comments: section 25356.
Comments Date: 02162000
Comments: RAP - The DTSC approved the Final RAP, dated February 14, 2000,
Comments Date: 02162000
Comments: for the Northern Shops Study Area, which consists of 35 acres
Comments Date: 02162000
Comments: of the 240 acre SPTCo-Sacramento Rail Yard Site. The approved
Comments Date: 02162000
Comments: alternative for remediation for the 180,650 cubic yards of
Comments Date: 02162000
Comments: contaminated soils identified the RAP is excavation, land
Comments Date: 02162000
Comments: farming, chemical stabilization and, off-site disposal.
Comments Date: 02162000
Comments: Implementation of the selected alternative is schedule to begin
Comments Date: 02162000
Comments: in May of 2000 and to continue through October of 2005.
Comments Date: 02162000
Comments: The preliminary cost of the proposed alternative is estimated
Comments Date: 02162000
Comments: to be $14,353,374.
Comments Date: 02162000
Comments: CEQA/NOD - The DTSC approved the Notice of Determination for the
Comments Date: 02162000
Comments: LSA Final Amended (FARAP), and the NSSA, CSNSA, and CCSA Final
Comments Date: 02162000
Comments: Remedial Action Plan (FRAP) on February 16, 2000.
Comments Date: 03091994
Comments: DESIGN (DSVSI) and DESIGN (DSGWI)--The designs approved
Comments Date: 03091994
Comments: extraction and treatment of VOCs and TPH in soil and
Comments Date: 03091994
Comments: groundwater at the former drum storage area facility.
Comments Date: 05072003
Comments: RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP)
Comments Date: 05072003
Comments: prepared to amend the February 2000 Final Amended Industrial
Comments Date: 05072003
Comments: Wastewater Lagoon RAP, and February 2000 Final Central Corridor,
Comments Date: 05072003
Comments: Car Shop Nine and Northern Shops RAP for Soil. The ACP
Comments Date: 05072003
Comments: establishes the process to identify the presence of and safety
Comments Date: 05072003

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments:	clean up of asbestos if found during future soil excavation.
Comments Date:	05072003
Comments:	In compliance with CEQA, DTSC has prepared a notice of
Comments Date:	05072003
Comments:	exemption. A comment period for the project was held from
Comments Date:	05072003
Comments:	February 25 through March 27, 2003. A public meeting was held on
Comments Date:	05072003
Comments:	March 11, 2003. Public comments were received by DTSC and
Comments Date:	05072003
Comments:	addressed through a responsiveness summary.
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an
Comments Date:	05072003
Comments:	Asbestos Contingency Plan (ACP) prepared to amend the February
Comments Date:	05072003
Comments:	2000 Final Amended Industrial Wastewater Lagoon RAP, and
Comments Date:	05072003
Comments:	February 2000 Final Central Corridor, Car Shop Nine, and Northern
Comments Date:	05072003
Comments:	Shops RAP for Soil. The ACP establishes the process to identify
Comments Date:	05072003
Comments:	the presence of and safely clean up asbestos if found during
Comments Date:	05072003
Comments:	future soil excavation. A comment period for the project was
Comments Date:	05072003
Comments:	held from 2/25/03 to 3/27/03. A public meeting was held on
Comments Date:	05072003
Comments:	3/11/03. Public comments were received by DTSC and addressed
Comments Date:	05072003
Comments:	through a responsiveness summary.
Comments Date:	05091990
Comments:	Removal of 432 cubic yards of soil.
Comments Date:	05222000
Comments:	DES - The DTSC approved the Final Remediation Design and Imple-
Comments Date:	05222000
Comments:	mentation Report (RDIP) on May 22, 2000, for the Northern Shops
Comments Date:	05222000
Comments:	Study Area.
Comments Date:	07081996
Comments:	ORDER (DOS&M) -- An Enforceable Agreement was completed for
Comments Date:	07081996
Comments:	the Operation and Maintenance of the groundwater and vapor
Comments Date:	07081996
Comments:	extraction systems at the former drum storage area facility.
Comments Date:	09151994
Comments:	FRA (DSVS1) and FRA (DSGW) -- The groundwater extraction and
Comments Date:	09151994
Comments:	treatment and soil vapor extraction and treatment systems
Comments Date:	09151994
Comments:	have been constructed at the former drum storage area facility.
Comments Date:	09151994
Comments:	Normal operation of the systems began 09/15/1994.
Comments Date:	12311998
Comments:	RI/FS -- THE NORTHERN SHOPS STUDY AREA (NSSA) REPRESENTS

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments Date: 12311998
Comments: APPROXIMATELY 35 ACRES OF THE 240-ACRE SPTCO-SACRAMENTO
Comments Date: 12311998
Comments: RAILYARD. THE APPROVED RIFS HAS INITIALLY IDENTIFIED 180,000
Comments Date: 12311998
Comments: CUBIC YARDS OF CONTAMINATED SOILS THAT WILL REQUIRE OFFSITE
Comments Date: 12311998
Comments: DISPOSAL.
ID Name: CALSITES ID NUMBER
ID Value: 34400004
ID Name: EPA IDENTIFICATION NUMBER
ID Value: CAD073772030
ID Name: BEP DATABASE PCODE
ID Value: P14032
ID Name: CALSTARS CODE
ID Value: 100139
Alternate Name: SP-SAC - DRUM STORAGE AREAUP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM SSOUTHERN PACIFIC TRANSPORTATION COSP, SAC - NORTHERN SHOPSSP, SAC - NORTHERN SHOPS/DRUM STORAGESP-SAC - LOCOMOTIVE WORKSSP-SAC - OVERALL SITESACRAMENTO RAILYARD FACILITYUNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Special Programs Code: R3012
Special Programs Name: RCRA 3012

Region: SACRAMENTO
Facility ID: 34400009
Facility Type: RP
Type: RESPONSIBLE PARTY
Branch: CC
Branch Name: CENTRAL CALIFORNIA
File Name: Not reported
State Senate District: 06031992
Status: ANNUAL WORKPLAN (AWP) - ACTIVE SITE
Status Name: ANNUAL WORKPLAN - ACTIVE SITE
Lead Agency: DEPT OF TOXIC SUBSTANCES CONTROL
NPL: Not Listed
SIC Code: 40
SIC Name: RAILROAD TRANSPORTATION
Access: Not reported
Cortese: Not reported
Hazardous Ranking Score: Not reported
Date Site Hazard Ranked: Not reported
Groundwater Contamination: Not reported
Staff Member Responsible for Site: SGOSS
Supervisor Responsible for Site: Not reported
Region Water Control Board: Not reported
Region Water Control Board Name: Not reported
Lat/Long Direction: Not reported
Lat/Long (dms): 0 0 0 / 0 0 0
Lat/long Method: Not reported
Lat/Long Description: Not reported
State Assembly District Code: 09
State Senate District Code: 06
Facility ID: 34400009
Activity: RIFS
Activity Name: REMEDIAL INVESTIGATION / FEASIBILITY STUDY
AWP Code: Not reported
Proposed Budget: 0

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	10051998
Est Person-Yrs to complete:	0
Estimated Size:	M
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400009
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02162000
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400009
Activity:	DES
Activity Name:	DESIGN
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05222000
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400009
Activity:	RMDL
Activity Name:	REMEDIAL ACTION (RAP REQUIRED)
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	09302006
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400009
Activity:	CERT
Activity Name:	CERTIFICATION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	12302010
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Unknown Type:	0
Facility ID:	34400009
Activity:	OM
Activity Name:	OPERATION & MAINTENANCE
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	12302032
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400009
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	NOD
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02162000
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400009
Activity:	DEED
Activity Name:	DEED RESTRICTIONS
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	07112001

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Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400009
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	ACP
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400009
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	NOE
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400009
Activity:	DES
Activity Name:	DESIGN
AWP Code:	RDIP
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	07292004
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Alternate Address:	401 I STREET
Alternate City,St,Zip:	SACRAMENTO, CA 95814
Background Info:	The Southern Pacific Transportation Company's (SPTCo) Sacramento Railyard Facility has been in operation since 1865. The site is approximately 240 acres. Inorganic and organic contamination are broadly distributed across a majority of the site. Additionally, liquid waste was historically disposed of in an industrial sewer system constructed over 100 years ago. On June 2, 1988, the Department and SPTCo entered into an Enforceable Agreement. A workplan and schedule for investigation and cleanup was finalized in October of 1988. Based on historical usage and known contamination the site was divided into six study areas: Central Shops (CSSA), Central Corridor (CCSA), Carshop Nine (CSNSA), Lagoon (LSA), Northern Shops (NSSA), and Sacramento Station (SSSA). The Car Shop Nine was utilized for constructing rail cars, painting rail cars, sandblasting, general offices, and rail yard operations building. Five UST's were located in Car Shop Nine. The soil is contaminated with metals, Volatile Organic Compounds (VOC's), Semi Volatile Organic Compounds (SVOC's), Poly Nuclear Aromatics (PAH's), and Total Petroleum Hydrocarbons (TPH). Groundwater contamination includes metals, VOC's, and Total Petroleum Hydrocarbons TPH.
Comments Date:	02162000
Comments:	RAP - The DTSC approved the Final RAP, for the Car Shop Nine
Comments Date:	02162000

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Comments:	Study Area, which consists of 40 acres of the 240 acre SPTCo-
Comments Date:	02162000
Comments:	Sacramento Rail Yard site. The approved alternative for
Comments Date:	02162000
Comments:	approved alternative for remediation for the 132,718 cubic yards
Comments Date:	02162000
Comments:	of contaminated soils identified in the RAP is excavation, land
Comments Date:	02162000
Comments:	farming, chemcial stabilization and, off-site disposal.
Comments Date:	02162000
Comments:	Implementation of selected alternative is scheduled to being
Comments Date:	02162000
Comments:	in May of 2000 and to continue through October of 2005. The
Comments Date:	02162000
Comments:	preliminary cost of the proposed alternatibe is estimated to
Comments Date:	02162000
Comments:	be $8,050,957.
Comments Date:	02162000
Comments:	CEQA/NOD - The DTSC approved the Notice of Determination for the
Comments Date:	02162000
Comments:	LSA Final Amended (FARAP), and the NSSA, CSNSA, and CCSA Final
Comments Date:	02162000
Comments:	Remedial Action Plan (FRAP).
Comments Date:	05072003
Comments:	RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP)
Comments Date:	05072003
Comments:	prepared to amend the February 2000 Final Amended Industrial
Comments Date:	05072003
Comments:	Wastewater Lagoon RAP, and February 2000 Final Central Corridor,
Comments Date:	05072003
Comments:	Car Shop Nine and Northern Shops RAP for Soil. The ACP
Comments Date:	05072003
Comments:	establishes the process to identify the presence of and safety
Comments Date:	05072003
Comments:	clean up of asbestos if found during future soil excavation.
Comments Date:	05072003
Comments:	In compliance with CEQA, DTSC has prepared a notice of
Comments Date:	05072003
Comments:	exemption. A comment period for the project was held from
Comments Date:	05072003
Comments:	February 25 through March 27, 2003. A public meeting was held on
Comments Date:	05072003
Comments:	March 11, 2003. Public comments were received by DTSC and
Comments Date:	05072003
Comments:	addressed through a responsiveness summary.
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an
Comments Date:	05072003
Comments:	Asbestos Contingency Plan (ACP) prepared to amend the February
Comments Date:	05072003
Comments:	2000 Final Amended Industrial Wastewater Lagoon RAP, and
Comments Date:	05072003
Comments:	February 2000 Final Central Corridor, Car Shop Nine, and Northern
Comments Date:	05072003
Comments:	Shops RAP for Soil. The ACP establishes the process to identify

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Comments Date:	05072003
Comments:	the presence of and safely clean up asbestos if found during
Comments Date:	05072003
Comments:	future soil excavation. A comment period for the project was
Comments Date:	05072003
Comments:	held from 2/25/03 to 3/27/03. A public meeting was held on
Comments Date:	05072003
Comments:	3/11/03. Public comments were received by DTSC and addressed
Comments Date:	05072003
Comments:	through a responsiveness summary.
Comments Date:	05222000
Comments:	DES - The DTSC approved the Final Remediation Design and Imple-
Comments Date:	05222000
Comments:	mentation Report (RDIP) on May 22, 2000, for the Car Shop Nine
Comments Date:	05222000
Comments:	Study Area, 40 acres of the 240 acre SPTCo - Sacramento Rail Yard
Comments Date:	05222000
Comments:	Site. The approved RDIP is for the 132,718 cubic yards of
Comments Date:	05222000
Comments:	contaminated soils consists of excavation, land farming,
Comments Date:	05222000
Comments:	chemical stabilization and, off-site disposal. Implementation of
Comments Date:	05222000
Comments:	the RDIP is scheduled to begin in May of 2000, and to continue
Comments Date:	05222000
Comments:	through October of 2005. The preliminary costs of the proposed
Comments Date:	05222000
Comments:	alternative is estimated to be 8,050,957.
Comments Date:	07292004
Comments:	DES/RDIP -- DESIGN/REMEDIAL DESIGN IMPLEMENTATION PLAN. THE CAR
Comments Date:	07292004
Comments:	SHOP NINE STUDY AREA (CSNSA) IS APPROXIMATELY 44 ACRES OF THE
Comments Date:	07292004
Comments:	240 ACRE FORMER SPTCO RAIL YARD LOCATED IN DOWNTOWN SACRAMENTO.
Comments Date:	07292004
Comments:	THE CSNSA WAS UTILIZED FOR CONSTRUCTING AND PAINTING RAIL CARS;
Comments Date:	07292004
Comments:	SANDBLASTING; GENERAL OFFICES; AND RAIL YARD OPERATIONS. THE
Comments Date:	07292004
Comments:	RDIP 2004 PROVIDES FOR EXCAVATIONS, STORAGE, TREATMENT, AND
Comments Date:	07292004
Comments:	OFFSITE DISPOSAL OF APPROXIMATELY 120,000 CUBIC YARDS OF SOIL
Comments Date:	07292004
Comments:	CONTAMINATED VOLATILE ORGANIC COMPOUNDS (VOCs), SVOC, AND
Comments Date:	07292004
Comments:	TOTAL PETROLEUM HYDROCARBON (TPH) IN THE CAR SHOP NINE STUDY
Comments Date:	07292004
Comments:	AREA, LAGOON STUDY AREA, AND CENTRAL CORRIDOR STUDY AREA FOR
Comments Date:	07292004
Comments:	WHICH REMEDIAL ACTION PLANS (RAPs) HAVE BEEN PREVIOUSLY APPROVED.
Comments Date:	10051998
Comments:	RI/FS -- The Union Pacific Railroad Company has completed soil
Comments Date:	10051998
Comments:	characterization of the former Southern Pacific Transportation
Comments Date:	10051998
Comments:	Company - Sacramento Railyard Car Shop Nine Study Area (CSNSA).
Comments Date:	10051998

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments:	Groundwater contamination for the CSNSA will be addressed within
Comments Date:	10051998
Comments:	the Lagoon Groundwater and Central Shops South Plume RI/FS and
Comments Date:	10051998
Comments:	RAP. The CSNSA was utilized for constructing rail cars, painting
Comments Date:	10051998
Comments:	rail cars, sandblasting, general offices and railyard operations
Comments Date:	10051998
Comments:	buildings. Additionally, five Underground Storage Tanks were
Comments Date:	10051998
Comments:	located at the CSNSA. During Phase I characterization,
Comments Date:	10051998
Comments:	soil gas samples were collected from 11 locations, 31 soil
Comments Date:	10051998
Comments:	borings were drilled and sampled, andgroundwater samples
Comments Date:	10051998
Comments:	were collected from 24 locations. During
Comments Date:	10051998
Comments:	Phase II, the final Phase 25 additional soil borings were
Comments Date:	10051998
Comments:	drilled. Compounds of concern (COC'S) detected in the soil
Comments Date:	10051998
Comments:	included VOC'S-VC and TCE, SVOC'S-PNA'S, Anthracene and Chrysene,
Comments Date:	10051998
Comments:	TPH-#2 and #6 fuel oil, oil and grease and extractable and
Comments Date:	10051998
Comments:	metals-arsenic, Lead, Cadmium, and beryllium. The lateral and
Comments Date:	10051998
Comments:	vertical extent of COC'S detected in the soil has been
Comments Date:	10051998
Comments:	sufficiently defined for purposes of developing the soil, final
Comments Date:	10051998
Comments:	remedial action objectives.
ID Name:	CALSITES ID NUMBER
ID Value:	34400004
ID Name:	CALSTARS CODE
ID Value:	100139
Alternate Name:	SOUTHERN PACIFIC TRANSPORTATION COMPANYSP, SAC - CAR SHOP NINESP-SAC - LOCOMOTIVE WORKSSP-SAC - OVERALL SITESACRAMENTO RAILYARD FACILITYUNION PACIFIC RAILROAD-SACRAMENTO RAILYDUP, DOWNTOWN SAC - CAR SHOP NINE
Special Programs Code:	Not reported
Special Programs Name:	Not reported
Region:	SACRAMENTO
Facility ID:	34400010
Facility Type:	RP
Type:	RESPONSIBLE PARTY
Branch:	CC
Branch Name:	CENTRAL CALIFORNIA
File Name:	Not reported
State Senate District:	06031992
Status:	ANNUAL WORKPLAN (AWP) - ACTIVE SITE
Status Name:	ANNUAL WORKPLAN - ACTIVE SITE
Lead Agency:	DEPT OF TOXIC SUBSTANCES CONTROL
NPL:	Not Listed
SIC Code:	40
SIC Name:	RAILROAD TRANSPORTATION

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Access:	Not reported
Cortese:	Not reported
Hazardous Ranking Score:	Not reported
Date Site Hazard Ranked:	Not reported
Groundwater Contamination:	Not reported
Staff Member Responsible for Site:	SGOSS
Supervisor Responsible for Site:	Not reported
Region Water Control Board:	Not reported
Region Water Control Board Name:	Not reported
Lat/Long Direction:	Not reported
Lat/Long (dms):	0 0 0 / 0 0 0
Lat/long Method:	Not reported
Lat/Long Description:	Not reported
State Assembly District Code:	09
State Senate District Code:	06
Facility ID:	34400010
Activity:	RIFS
Activity Name:	REMEDIAL INVESTIGATION / FEASIBILITY STUDY
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	10051998
Est Person-Yrs to complete:	0
Estimated Size:	S
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400010
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02162000
Est Person-Yrs to complete:	0
Estimated Size:	S
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400010
Activity:	DES
Activity Name:	DESIGN
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05222000
Est Person-Yrs to complete:	0
Estimated Size:	S
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400010
Activity:	RMDL
Activity Name:	REMEDIAL ACTION (RAP REQUIRED)
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	09302006
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	S
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400010
Activity:	CERT
Activity Name:	CERTIFICATION

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	12302010
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	S
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400010
Activity:	OM
Activity Name:	OPERATION & MAINTENANCE
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	12302032
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400010
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	NOD
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02162000
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400010
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	ESD
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	04172002
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400010
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	NOD
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	04172002
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400010
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	ACP
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400010
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	NOE
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05072003
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400010
Activity:	DES
Activity Name:	DESIGN
AWP Code:	RDIP
Proposed Budget:	0
AWP Completion Date:	Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Revised Due Date:	Not reported
Comments Date:	07292004
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Alternate Address:	401 I STREET
Alternate City,St,Zip:	SACRAMENTO, CA 95814
Background Info:	The Southern Pacific Transportation Company's (SPTCo) Sacramento Railyard Facility has been in operation since 1865. The site is approximately 240 acres. Inorganic and organic contamination are broadly distributed across a majority of the site. Additionally, liquid waste was historically disposed of in an industrial sewer system constructed over 100 years ago. On June 2, 1988, the Department and SPTCo entered into an Enforceable Agreement. A workplan and schedule for investigatio and cleanup was finalized in October of 1988. Based on historical usage and known contamination the site wa divided into six study areas: Central Shops (CSSA), Central Corridor (CCSA), Carshop Nine (CSNSA), Lagoon (LSA), Northern Shops (NSSA), and Sacramento Station (SSSA). The Central Corridor was used for boxcar cleaning, boxcar dis- mantling, boxcar sandblasting, and a saw mill utilized for lumber milling planing and woodworking. The soil is contaminated wth metals, Volatile Organic Compounds (VOC's), Semi Volatile Organic Compounds (SVOC's), Poly Nuclear Aromatics (PAH's), and Total Petroleum Hydrocarbons (TPH). Groundwater contamination includes metals, VOC's, SVOC's, and Total Petroleum Hydrocarbons TPH.
Comments Date:	07292004
Comments:	PLAINING, AND WOODWORKING. THE RDIP 2004 PROVIDES FOR
Comments Date:	07292004
Comments:	EXCAVATION, STORAGE, TREATMENT, AND OFFSITE DISPOSAL OF
Comments Date:	07292004
Comments:	APPROXIMATELY 120,000 CUBIC YARDS OF SOIL CONTAMINATED WITH
Comments Date:	07292004
Comments:	VOLATILE ORGANIC COMPOUNDS (VOCs), SVOC, AND TOTAL PETROLEUM
Comments Date:	07292004
Comments:	HYDROCARBON (TPH) IN THE CENTRAL CORRIDOR STUDY AREA, CAR SHOP
Comments Date:	07292004
Comments:	NINE STUDY AREA, AND LAGOON STUDY AREA FOR WHICH REMEDIAL ACTION
Comments Date:	07292004
Comments:	PLANS (RAPs) HAVE BEEN PREVIOUSLY APPROVED.
Comments Date:	10051998
Comments:	RI/FS - The Union Pacific Railroad Company has completed soil
Comments Date:	10051998

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments:	characterization of the former Southern Pacific Transportation
Comments Date:	10051998
Comments:	Company - Sacramento Railyard, Central Corridor Study Area
Comments Date:	10051998
Comments:	(CCSA). Groundwater contamination for the CCSA will be addressed
Comments Date:	10051998
Comments:	within the Lagoon groundwater and Central Shops/South Plume
Comments Date:	10051998
Comments:	Remedial Investigation/Feasibility Study (RI/FS) and Remedial
Comments Date:	10051998
Comments:	Action Plan (RAP). The CCSA was utilized for boxcar cleaning
Comments Date:	10051998
Comments:	and dismantiling, sandblasting, general offices, and a sawmill.
Comments Date:	10051998
Comments:	Additionally, four underground storage tanks (USTs) were located
Comments Date:	10051998
Comments:	at the CCSA. During Phase 1 Characterization, soil gas samples
Comments Date:	10051998
Comments:	were collected from 69 locations, 22 soil borings were drilled
Comments Date:	10051998
Comments:	and sampled, and groundwater samples were collected from 12
Comments Date:	10051998
Comments:	locations. During Phase II, the final phase, 19 additional
Comments Date:	10051998
Comments:	soil borings were drilled. Compunds of concern (COC's) detected
Comments Date:	10051998
Comments:	in the soil included volatile organic compounds (VOCs) - vinyl
Comments Date:	10051998
Comments:	chloride (VC) and Trichloroethylene (TCE), Semi-volatile organic
Comments Date:	10051998
Comments:	compounds (SVOCs)- Polynuclear Aromatics (PNAs), anthracene and
Comments Date:	10051998
Comments:	chrysene, Total petroleum hydrocarbons TPH-#2 and #6 fuel oil, oi
Comments Date:	10051998
Comments:	and grease and extractable, and metal-arsenic, lead, cadmium, and
Comments Date:	10051998
Comments:	beryllium. The lateral and vertical extent of COCs detected in
Comments Date:	10051998
Comments:	the soil has been sufficiently defined for purposes of
Comments Date:	10051998
Comments:	developing the soil, final remedial action objectives.
Comments Date:	02162000
Comments:	RAP - The DTSC approved the Final RAP for the Central Corridor
Comments Date:	02162000
Comments:	Study Area which consists of 29 acts of the 240 acre
Comments Date:	02162000
Comments:	Southern Pacific Transportation- Sacramento Rail Yard Site. The
Comments Date:	02162000
Comments:	approved alternative for remediation for the 98,888 cubic yards
Comments Date:	02162000
Comments:	of contaminated soils identified in the RAP is excavation, land
Comments Date:	02162000
Comments:	farming, chemical stabilization and off-site disposal.
Comments Date:	02162000
Comments:	Implementation of the selected alternative is scheduled to begin
Comments Date:	02162000
Comments:	in May of 2000 and to continue through October of 2005. The

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments Date:	02162000
Comments:	preliminary cost of proposed alternative is estimated to be
Comments Date:	02162000
Comments:	$5,998,757.
Comments Date:	02162000
Comments:	Not reported
Comments Date:	02162000
Comments:	CEQA/NOD - The DTSC approved the Notice of Determination for the
Comments Date:	02162000
Comments:	LSA Final Amended RAP(FARAP), and the NSSA, CSNSA, and CCSA Final
Comments Date:	02162000
Comments:	Remedial Action Plan (FRAP) on February 16, 2000.
Comments Date:	04172002
Comments:	RAP - ESD -- The Department has approved an Explanation of
Comments Date:	04172002
Comments:	Significant Differences (ESD) on 4/17/02 to permit soil
Comments Date:	04172002
Comments:	bioremediation treatment on-site. Soil remediation strategies
Comments Date:	04172002
Comments:	approved under the site Remedial Action Plans (RAP) includes
Comments Date:	04172002
Comments:	excavation of impacted soil, treating certain soil prior to
Comments Date:	04172002
Comments:	reuse or disposal, and loading all waste soil for off-site
Comments Date:	04172002
Comments:	disposal to a landfill. Treatment options approved under the
Comments Date:	04172002
Comments:	RAP did not specifically include bioremediation of soil. The
Comments Date:	04172002
Comments:	enclosed ESD has been prepared to amend the site RAP
Comments Date:	04172002
Comments:	administrative record to include bioremediation treatment of
Comments Date:	04172002
Comments:	stockpiled soil containing petroleum hydrocarbon. The proposed
Comments Date:	04172002
Comments:	change is protective of human health and the environment,
Comments Date:	04172002
Comments:	complies with appropriate, applicable or relevant federal and
Comments Date:	04172002
Comments:	state requirements and remains cost-effective.
Comments Date:	04172002
Comments:	CEQA - NOD -- The Department approved an Explanation of
Comments Date:	04172002
Comments:	Significant Differences (ESD) on 4/17/02 to permit soil
Comments Date:	04172002
Comments:	bioremediation treatment on-site. To meet the requirements
Comments Date:	04172002
Comments:	of the California Environmental Quality Act, DTSC, in its role
Comments Date:	04172002
Comments:	as the Lead Agency for the soil remediation of the site, has
Comments Date:	04172002
Comments:	considered the Environmental Impact Reports prepared for and
Comments Date:	04172002
Comments:	certified by the City of Sacramento (City). DTSC has determined
Comments Date:	04172002
Comments:	that the EIRs and supporting documents relied on for approval of
Comments Date:	04172002

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments:	the site soil Remedial Action Plans have adequately adddressed
Comments Date:	04172002
Comments:	the potential impacts of the project proposed under the ESD.
Comments Date:	04172002
Comments:	DTSC, using its independent judgement has determined that the
Comments Date:	04172002
Comments:	project, in its approved form, will not result in a significant
Comments Date:	04172002
Comments:	adverse effect on the environment. A Notice of Determination
Comments Date:	04172002
Comments:	indicating the results of said findings has been filed with the
Comments Date:	04172002
Comments:	State Clearninghouse of the Governor's Office of Planning and
Comments Date:	04172002
Comments:	Research pursuant to Section 15096(i) of the State CEQA
Comments Date:	04172002
Comments:	Guidelines.
Comments Date:	05072003
Comments:	RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP)
Comments Date:	05072003
Comments:	prepared to amend the February 2000 Final Amended Industrial
Comments Date:	05072003
Comments:	Wastewater Lagoon RAP, and February 2000 Final Central Corridor,
Comments Date:	05072003
Comments:	Car Shop Nine and Northern Shops RAP for Soil. The ACP
Comments Date:	05072003
Comments:	establishes the process to identify the presence of and safety
Comments Date:	05072003
Comments:	clean up of asbestos if found during future soil excavation.
Comments Date:	05072003
Comments:	In compliance with CEQA, DTSC has prepared a notice of
Comments Date:	05072003
Comments:	exemption. A comment period for the project was held from
Comments Date:	05072003
Comments:	February 25 through March 27, 2003. A public meeting was held on
Comments Date:	05072003
Comments:	March 11, 2003. Public comments were received by DTSC and
Comments Date:	05072003
Comments:	addressed through a responsiveness summary.
Comments Date:	05072003
Comments:	Not reported
Comments Date:	05072003
Comments:	CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an
Comments Date:	05072003
Comments:	Asbestos Contingency Plan (ACP) prepared to amend the February
Comments Date:	05072003
Comments:	2000 Final Amended Industrial Wastewater Lagoon RAP, and
Comments Date:	05072003
Comments:	February 2000 Final Central Corridor, Car Shop Nine, and Northern
Comments Date:	05072003
Comments:	Shops RAP for Soil. The ACP establishes the process to identify
Comments Date:	05072003
Comments:	the presence of and safely clean up asbestos if found during
Comments Date:	05072003
Comments:	future soil excavation. A comment period for the project was
Comments Date:	05072003
Comments:	held from 2/25/03 to 3/27/03. A public meeting was held on

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Comments Date: 05072003
Comments: 3/11/03. Public comments were received by DTSC and addressed
Comments Date: 05072003
Comments: through a responsiveness summary.
Comments Date: 05222000
Comments: DES - The DTSC approved the Final Remediation Design and Imple-
Comments Date: 05222000
Comments: mentation Report (RDIP) on May 22, 2000, for the Central Corridor
Comments Date: 05222000
Comments: Study Area, 29 acres of the 240 acre SPTCo - Sacramento Rail Yard
Comments Date: 05222000
Comments: Site. The approved RDIP for remediation for the 98,888 cubic
Comments Date: 05222000
Comments: yards of contaminated soils consists of excavation, land farming,
Comments Date: 05222000
Comments: chemical stabilization and, off-site disposal. Implementation of
Comments Date: 05222000
Comments: the RDIP is scheduled to begin in May of 2000, and to continue
Comments Date: 05222000
Comments: through October of 2005. The preliminary costs of the proposed
Comments Date: 05222000
Comments: alternative is estimated to be 5,998,757.
Comments Date: 07292004
Comments: DES/RDIP -- DESIGN/REMEDIAL DESIGN IMPLEMENTATION PLAN. THE CAR
Comments Date: 07292004
Comments: SHOP NINE STUDY AREA (CSSA) IS APPROXIMATELY 35 ACRES OF THE
Comments Date: 07292004
Comments: 240 ACRE FORMER SPTCO RAIL YARD LOCATED IN DOWNTOWN SACRAMENTO.
Comments Date: 07292004
Comments: THE CSSA WAS UTILIZED FOR BOXCAR CLEANING DISMANTLING AND
Comments Date: 07292004
Comments: SANDBLASTING. A SAWMILL WAS UTILIZED FOR LUMBER MILLING,
ID Name: EPA IDENTIFICATION NUMBER
ID Value: CAD073772030
ID Name: CALSITES ID NUMBER
ID Value: 34400004
ID Name: CALSTARS CODE
ID Value: 100139
Alternate Name: SP-SAC LOCOMOTIVE WORKSSOUTHERN PACIFIC TRANSPORTATION COSP, SAC - CENTRAL CORRIDORSP-SAC OVERALL SITESACRAMENTO RAILYARD FACILITYUNION PACIFIC RAILROAD-SACRAMENTO RAILYDUP, DOWNTOWN SAC - CENTRAL CORRIDOR
Special Programs Code: Not reported
Special Programs Name: Not reported

CHMIRS:
OES Incident Number: 06-1966
OES notification: 04/03/2006
OES Date: Not reported
OES Time: Not reported
Incident Date: Not reported
Date Completed: Not reported
Property Use: Not reported
Agency Id Number: Not reported
Agency Incident Number: Not reported
Time Notified: Not reported
Time Completed: Not reported
Surrounding Area: Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Estimated Temperature:	Not reported
Property Management:	Not reported
More Than Two Substances Involved?:	Not reported
Resp Agncy Personel # Of Decontaminated:	Not reported
Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported
Others Number Of Fatalities:	Not reported
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA DOT PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	Not reported
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	Contractor
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	2006
Agency:	Amtrak
Incident Date:	4/3/2006 12:00:00 AM
Admin Agency:	Sacramento City Fire Department
Amount:	Not reported
Contained:	Yes
Site Type:	Rail Road
E Date:	Not reported
Substance:	diesel fuel
Gallons:	10-15
Unknown:	0
Substance #2:	Not reported
Substance #3:	Not reported
Evacuations:	0
Number of Injuries:	0
Number of Fatalities:	0
#1 Pipeline:	Not reported
#2 Pipeline:	Not reported
#3 Pipeline:	Not reported
#1 Vessel >= 300 Tons:	Not reported
#2 Vessel >= 300 Tons:	Not reported
#3 Vessel >= 300 Tons:	Not reported
Evacs:	Not reported
Injuries:	Not reported
Fatals:	Not reported
Comments:	Not reported
Description:	Released due to human error, fuel vendor appears to have overfilled the locomotive tank.

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

OES Incident Number:	03-3608	
OES notification:	07/18/2003	
OES Date:	Not reported	
OES Time:	Not reported	
Incident Date:	Not reported	
Date Completed:	**Not reported**	
Property Use:	Not reported	
Agency Id Number:	Not reported	
Agency Incident Number:	Not reported	
Time Notified:	Not reported	
Time Completed:	Not reported	
Surrounding Area:	Not reported	
Estimated Temperature:	Not reported	
Property Management:	Not reported	
More Than Two Substances Involved?:		Not reported
Resp Agncy Personel # Of Decontaminated:		Not reported
Responding Agency Personel # Of Injuries:		Not reported
Responding Agency Personel # Of Fatalities:		Not reported
Others Number Of Decontaminated:		Not reported
Others Number Of Injuries:		Not reported
Others Number Of Fatalities:		Not reported
Vehicle Make/year:	Not reported	
Vehicle License Number:	Not reported	
Vehicle State:	Not reported	
Vehicle Id Number:	Not reported	
CA DOT PUC/ICC Number:	Not reported	
Company Name:	Not reported	
Reporting Officer Name/ID:	Not reported	
Report Date:	Not reported	
Facility Telephone:	Not reported	
Waterway Involved:	No	
Waterway:	Not reported	
Spill Site:	Not reported	
Cleanup By:	Reporting Party	
Containment:	Not reported	
What Happened:	Not reported	
Type:	Not reported	
Measure:	Not reported	
Other:	Not reported	
Date/Time:	Not reported	
Year:	2003	
Agency:	Union Pacific Railroad	
Incident Date:	7/18/200312:00:00 AM	
Admin Agency:	Not reported	
Amount:	Not reported	
Contained:	Yes	
Site Type:	Rail Road	
E Date:	Not reported	
Substance:	Train Derailment	
Gallons:	0.000000	
Unknown:	0	
Substance #2:	Not reported	
Substance #3:	Not reported	
Evacuations:	0	
Number of Injuries:	1	
Number of Fatalities:	0	
#1 Pipeline:	Not reported	

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

#2 Pipeline:	Not reported
#3 Pipeline:	Not reported
#1 Vessel >= 300 Tons:	Not reported
#2 Vessel >= 300 Tons:	Not reported
#3 Vessel >= 300 Tons:	Not reported
Evacs:	Not reported
Injuries:	Not reported
Fatals:	Not reported
Comments:	Not reported
Description:	Amtrak train stopped at Sacramento depot and freight train ran into back of it. No Spills of materials reported

OES Incident Number:	05-3945
OES notification:	07/01/2005
OES Date:	Not reported
OES Time:	Not reported
Incident Date:	Not reported
Date Completed:	**Not reported**
Property Use:	Not reported
Agency Id Number:	Not reported
Agency Incident Number:	Not reported
Time Notified:	Not reported
Time Completed:	Not reported
Surrounding Area:	Not reported
Estimated Temperature:	Not reported
Property Management:	Not reported
More Than Two Substances Involved?:	Not reported
Resp Agncy Personel # Of Decontaminated:	Not reported
Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported
Others Number Of Fatalities:	Not reported
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA DOT PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	Not reported
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	Unknown
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	2005
Agency:	Amtrak
Incident Date:	7/1/200512:00:00 AM
Admin Agency:	Sacramento City Fire Department
Amount:	Not reported

UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S (Continued) **S105954432**

Contained:	Yes
Site Type:	Rail Road
E Date:	Not reported
Substance:	Diesel
Gallons:	3
Unknown:	0
Substance #2:	Not reported
Substance #3:	Not reported
Evacuations:	0
Number of Injuries:	0
Number of Fatalities:	0
#1 Pipeline:	Not reported
#2 Pipeline:	Not reported
#3 Pipeline:	Not reported
#1 Vessel >= 300 Tons:	Not reported
#2 Vessel >= 300 Tons:	Not reported
#3 Vessel >= 300 Tons:	Not reported
Evacs:	Not reported
Injuries:	Not reported
Fatals:	Not reported
Comments:	Not reported
Description:	Fuel vendor was changing nossels and when he disconnected it caused 3 gallons to spill

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J92 **SP, SAC - SACRAMENTO STATION** **CA HIST Cal-Sites** **S101481755**
SE **401 I STREET** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.032 mi.
167 ft. **Site 11 of 16 in cluster J**

Relative:
Higher

Actual:
24 ft.

Calsite:

Region:	SACRAMENTO
Facility ID:	34400006
Facility Type:	RP
Type:	RESPONSIBLE PARTY
Branch:	CC
Branch Name:	CENTRAL CALIFORNIA
File Name:	Not reported
State Senate District:	06021994
Status:	CERTIFIED AS HAVING BEEN REMEDIED SATISFACTORILY UNDER DTSC OVERSIGHT
Status Name:	CERTIFIED
Lead Agency:	DEPT OF TOXIC SUBSTANCES CONTROL
NPL:	Not Listed
SIC Code:	40
SIC Name:	RAILROAD TRANSPORTATION
Access:	Not reported
Cortese:	Not reported
Hazardous Ranking Score:	Not reported
Date Site Hazard Ranked:	Not reported
Groundwater Contamination:	Confirmed
Staff Member Responsible for Site:	SGOSS
Supervisor Responsible for Site:	Not reported
Region Water Control Board:	Not reported
Region Water Control Board Name:	Not reported
Lat/Long Direction:	Not reported
Lat/Long (dms):	0 0 0 / 0 0 0
Lat/long Method:	Not reported
Lat/Long Description:	Not reported

SP, SAC - SACRAMENTO STATION (Continued) **S101481755**

State Assembly District Code:	09
State Senate District Code:	06
Facility ID:	34400006
Activity:	ORDER
Activity Name:	I/SE, IORSE, FFA, FFSRA, VCA, EA
AWP Code:	AGREE
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06021988
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400006
Activity:	ORDER
Activity Name:	I/SE, IORSE, FFA, FFSRA, VCA, EA
AWP Code:	AGREE
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02021989
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400006
Activity:	PPP
Activity Name:	PUBLIC PARTICIPATION PLAN
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported

SP, SAC - SACRAMENTO STATION (Continued) **S101481755**

Comments Date:	02281989
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400006
Activity:	RIFS
Activity Name:	REMEDIAL INVESTIGATION / FEASIBILITY STUDY
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	08301989
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400006
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	12301989
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported

SP, SAC - SACRAMENTO STATION (Continued) **S101481755**

Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400006
Activity:	RA
Activity Name:	REMOVAL ACTION
AWP Code:	SOIL
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	04101991
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	6500
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	DISPOSED OF IN A CLASS I LANDFILL.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400006
Activity:	RA
Activity Name:	REMOVAL ACTION
AWP Code:	COVER
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	04101991
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	X
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	APPROX. 800 SQ FEET OF HYDROCARBON CONTAMINATED SOIL SURFACE WASCOVERED WITH A RAIN INFILTRATION BARRIER.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0

SP, SAC - SACRAMENTO STATION (Continued) **S101481755**

Facility ID:	34400006
Activity:	DES
Activity Name:	DESIGN
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05301992
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400006
Activity:	CERT
Activity Name:	CERTIFICATION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06021994
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	19300
Liquids Treated (Gals):	233
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	EXCAVATION OF CONTAMINATED SOIL. DISPOSAL OF LEAD CONTAMINATED SOILTO CONTROLLED LANDFILLS. TREATMENT OF RCRA CHARACTERISTIC LEADCONTAMINATED SOIL AND DISPOSAL TO A CONTROLLED LANDFILL.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400006
Activity:	DEED
Activity Name:	DEED RESTRICTIONS
AWP Code:	RESTR
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported

SP, SAC - SACRAMENTO STATION (Continued) **S101481755**

Comments Date:	05191994
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34400006
Activity:	FRA
Activity Name:	FINAL REMEDIAL ACTION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06021994
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Alternate Address:	401 I STREET
Alternate City,St,Zip:	SACRAMENTO, CA 95814
Background Info:	The Southern Pacific Transportation Company's (SPTCo) Sacramento Railyard Facility has been in operation since 1865. The site is approximately 240 acres. Inorganic and organic contamination are broadly distributed across a majority of the site. Additionally, liquid waste was historically disposed of in an industrial sewer system constructed over 100 years ago. On June 2, 1988, the Department and SPTCo entered into an Enforceable Agreement. A workplan and schedule for investigation and cleanup was finalized in October of 1988. Based on historical usage and known contamination the site was divided into six study areas: Central Shops and, Central Corridor, Car Shops Nine, Lagoon, Northern Shops, and Sacramento Station. The Sacramento Station was as a wheel foundry and depot. The

SP, SAC - SACRAMENTO STATION (Continued) **S101481755**

soil was contaminated with metals and Total Petroleum Hydro-
carbons (TPH). Groundwater contamination includes metals and
Semi Volatile Organic Compounds and Total Petroleum Hydrocarbons
TPH.

Comments Date: 11011990
Comments: This is the date the site was first listed pursuant to
Comments Date: 11011990
Comments: section 25356.
Comments Date: 11091990
Comments: Removal of 6500 cubic yards of soil.
Comments Date: 03181991
Comments: Removal Action: Cover 800 square feet with barrier.
Comments Date: 06021994
Comments: FRA/DEED/CERT -- the site has been certified for soil
Comments Date: 06021994
Comments: remedial activities under the Remedial Action Plan. A
Comments Date: 06021994
Comments: Deed Restriction has been recorded which limits land use to
Comments Date: 06021994
Comments: commercial and industrial uses.
Comments Date: 06021994
Comments: Volume Recycled/Reused: 16,300 cubic yds
Comments Date: 06021994
Comments: Volume Disposed: 19,300 cubic yds
Comments Date: 06021994
Comments: Total Volume Treated/Stab/Disposed: 35,600 cubic yds
Comments Date: 06021994
Comments: # Acres of land returned/released: 37 acres
Comments Date: 07251991
Comments: Railyard facility. Contaminants include Pb, Sb, Cu, TPH,
Comments Date: 07251991
Comments: chlorobenzene, 1,1-DCA, 1,2-DCA, 1,1-DCE, 1,2-DCE,
Comments Date: 07251991
Comments: 1,1,1-TCA, toluene, ethyl benzene, and vinyl chloride.
ID Name: CALSITES ID NUMBER
ID Value: 34400004
ID Name: EPA IDENTIFICATION NUMBER
ID Value: CAD073772030
ID Name: BEP DATABASE PCODE
ID Value: P14013
ID Name: CALSTARS CODE
ID Value: 100139
Alternate Name: SOUTHERN PACIFIC TRANSPORTATION COSP, SAC - SACRAMENTO STATIONSP-SAC - LOCOMOTIVE WORKSSP-SAC - OVERALL SITESACRAMENTO RAILYARD FACILITYUNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Special Programs Code: R3012
Special Programs Name: RCRA 3012

J93
SE
< 1/8
0.032 mi.
167 ft.

Relative:
Higher

Actual:
24 ft.

UP, DOWNTOWN SAC - CAR SHOP NINE
401 I STREET
SACRAMENTO, CA 95814

Site 12 of 16 in cluster J

CA NPDES **S101300908**
CA Cortese **N/A**
CA HIST CORTESE
CA LUST
CA SLIC
CA Sacramento Co. CS
CA DEED
CA VCP
CA Sacramento Co. ML
CA RESPONSE
CA EMI
CA ENVIROSTOR
CA WMUDS/SWAT

NPDES:

Npdes Number:	CAS000002
Facility Status:	Terminated
Agency Id:	0
Region:	5S
Regulatory Measure Id:	402266
Order No:	2009-0009-DWQ
Regulatory Measure Type:	Enrollee
Place Id:	Not reported
WDID:	5S34C357454
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	02/26/2010
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	08/30/2013
Discharge Name:	City of Sacramento Public Works
Discharge Address:	915 I Street
Discharge City:	Sacramento
Discharge State:	California
Discharge Zip:	95814

Npdes Number:	CAS000002
Facility Status:	Terminated
Agency Id:	0
Region:	5S
Regulatory Measure Id:	340898
Order No:	2009-0009-DWQ
Regulatory Measure Type:	Enrollee
Place Id:	Not reported
WDID:	5S34C350786
Program Type:	Construction
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	02/15/2008
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	02/12/2013
Discharge Name:	S Thomas Enterprises of Sacramento LLC
Discharge Address:	431 I street
Discharge City:	sacramento
Discharge State:	California
Discharge Zip:	95814

CORTESE:

Region:	CORTESE
Envirostor Id:	34400009
Site/Facility Type:	STATE RESPONSE

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Cleanup Status:	ACTIVE - LAND USE RESTRICTIONS
Status Date:	06/03/1992
Site Code:	100139
Latitude:	38.589461
Longitude:	-121.49960
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	envirostor
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported

Region:	CORTESE
Envirostor Id:	34400010
Site/Facility Type:	STATE RESPONSE
Cleanup Status:	ACTIVE
Status Date:	06/03/1992
Site Code:	100139
Latitude:	38.585570
Longitude:	-121.50169
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	envirostor
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported

Region:	CORTESE
Envirostor Id:	34400004
Site/Facility Type:	STATE RESPONSE
Cleanup Status:	ACTIVE
Status Date:	01/01/1983
Site Code:	100139
Latitude:	38.585855
Longitude:	-121.50162
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	envirostor
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Region:	CORTESE
Envirostor Id:	34400008
Site/Facility Type:	STATE RESPONSE
Cleanup Status:	ACTIVE - LAND USE RESTRICTIONS
Status Date:	06/03/1992
Site Code:	100139
Latitude:	38.589503
Longitude:	-121.49685
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	envirostor
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported

Region:	CORTESE
Envirostor Id:	34400007
Site/Facility Type:	STATE RESPONSE
Cleanup Status:	ACTIVE
Status Date:	01/01/1990
Site Code:	100139
Latitude:	38.586534
Longitude:	-121.49983
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	envirostor
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported

Region:	CORTESE
Envirostor Id:	34400005
Site/Facility Type:	STATE RESPONSE
Cleanup Status:	CERTIFIED / OPERATION & MAINTENANCE - LAND USE RESTRICTIONS
Status Date:	01/12/1996
Site Code:	100139
Latitude:	38.588497
Longitude:	-121.49943
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	envirostor
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
Region:	CORTESE
Envirostor Id:	60001378
Site/Facility Type:	STATE RESPONSE
Cleanup Status:	ACTIVE
Status Date:	12/01/2009
Site Code:	102074
Latitude:	38.585855
Longitude:	-121.50162
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	envirostor
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
Region:	CORTESE
Envirostor Id:	60001957
Site/Facility Type:	STATE RESPONSE
Cleanup Status:	ACTIVE
Status Date:	01/08/2014
Site Code:	100139
Latitude:	38.584223
Longitude:	-121.50038
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	envirostor
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	LTNKA
Reg Id:	340118
Region:	CORTESE
Facility County Code:	34
Reg By:	CALSI
Reg Id:	34400004
Region:	CORTESE
Facility County Code:	34
Reg By:	CALSI

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Reg Id: 34400005

Region: CORTESE
Facility County Code: 34
Reg By: CALSI
Reg Id: 34400006

Region: CORTESE
Facility County Code: 34
Reg By: CALSI
Reg Id: 34400007

Region: CORTESE
Facility County Code: 34
Reg By: CALSI
Reg Id: 34400008

Region: CORTESE
Facility County Code: 34
Reg By: CALSI
Reg Id: 34400009

Region: CORTESE
Facility County Code: 34
Reg By: CALSI
Reg Id: 34400010

LUST:
Region: STATE
Global Id: T0606700084
Latitude: 38.5833131
Longitude: -121.5000305
Case Type: LUST Cleanup Site
Status: Completed - Case Closed
Status Date: 04/28/2000
Lead Agency: CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker: VJF
Local Agency: SACRAMENTO COUNTY LOP
RB Case Number: 340118
LOC Case Number: RO0000635
File Location: Not reported
Potential Media Affect: Aquifer used for drinking water supply
Potential Contaminants of Concern: Gasoline
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0606700084
Contact Type: Regional Board Caseworker
Contact Name: VERA FISCHER
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: vera.fischer@waterboards.ca.gov
Phone Number: Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Global Id:	T0606700084
Contact Type:	Local Agency Caseworker
Contact Name:	DANA BOOTH
Organization Name:	SACRAMENTO COUNTY LOP
Address:	8475 JACKSON ROAD, SUITE 240
City:	SACRAMENTO
Email:	boothd@saccounty.net
Phone Number:	Not reported

Status History:

Global Id:	T0606700084
Status:	Completed - Case Closed
Status Date:	04/28/2000

Global Id:	T0606700084
Status:	Open - Case Begin Date
Status Date:	07/31/1987

Regulatory Activities:

Global Id:	T0606700084
Action Type:	Other
Date:	07/31/1987
Action:	Leak Reported

LUST REG 5:

Region:	5
Status:	Case Closed
Case Number:	340118
Case Type:	Drinking Water Aquifer affected
Substance:	GASOLINE
Staff Initials:	VJF
Lead Agency:	Regional
Program:	LUFT
MTBE Code:	N/A

SLIC:

Region:	STATE
Facility Status:	**Completed - Case Closed**
Status Date:	09/23/2014
Global Id:	T10000005281
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	Not reported
Latitude:	38.5896378436382
Longitude:	-121.503703639178
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992
File Location:	Not reported
Potential Media Affected:	Not reported
Potential Contaminants of Concern:	Not reported
Site History:	In July 2013, while performing an asbestos removal action, a UST with an approximate capacity of 6,000 gallons was discovered underneath a concrete pad in the Northern Shops Study Area. UPRR removed the UST

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

and performed overexcavation of bunker fuel impacted soil during August and September 2013. The Downtown Sacramento Railyard is an approximately 240-acre site that was used for heavy industrial activities to maintain and repair trains. Groundwater is polluted with solvents (chlorinated volatile organic compounds or VOCs), metals and petroleum hydrocarbons that in a multi-zone plume currently approximately a half-mile long. Since March 1993 approximately 650 gallons of pure liquid phase fuel has been removed by bailing activities from the wells at the site. Since May 1995 approximately 400,000 gallons a day of polluted groundwater is pumped and treated to control migration and reduce concentrations. To date, approximately 840,000,000 gallons of contaminated groundwater has been pumped and discharged to the local wastewater treatment plant. Since August 1996 soil vapor extraction (SVE) of the major VOC source areas has effectively removed approximately 12,500 pounds of VOCs. During the period between 1994 and 2000, approximately 500,000 tons of impacted soil was removed from the site, and as much as 230,000 cubic yards of moderately impacted soil has been approved for consolidation in an on-site landfill currently under construction in the northwest corner of the property. The Central Valley Water Board is supporting the DTSC in the oversight of this cleanup. For more detailed information about the Railyards, please look under the individual SCP-sub areas. DTSC is lead designated agency. Water Board is lead support agency.

Click here to access the California GeoTracker records for this facility:

Region:	STATE
Facility Status:	**Open - Verification Monitoring**
Status Date:	11/20/2013
Global Id:	T10000005278
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	Not reported
Latitude:	38.5901577747125
Longitude:	-121.501300379901
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992
File Location:	Not reported
Potential Media Affected:	Not reported
Potential Contaminants of Concern:	Total Petroleum Hydrocarbons (TPH)
Site History:	In the spring and summer of 2013 an area approximately 8 acres in size was excavated to remove bunker fuel impacted soils just above the water table, with impacts extending to the water table and beyond in some places. Free product removal occurred in one exposed groundwater area throughout the summer before backfill occured in the Fall of 2013. Residual bunker fuel impacts below the water table will be addressed in the Lagoon Groundwater Study Area Feasibility Study. The Downtown Sacramento Railyard is an approximately 240-acre site that was used for heavy industrial activities to maintain and repair trains. Groundwater is polluted with solvents (chlorinated volatile organic compounds or VOCs), metals and petroleum hydrocarbons that in a multi-zone plume currently approximately a half-mile long. Since March 1993 approximately 650 gallons of pure liquid phase fuel has been removed by bailing activities from the wells at the site. Since May 1995 approximately 400,000 gallons a day of polluted groundwater

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

is pumped and treated to control migration and reduce concentrations. To date, approximately 840,000,000 gallons of contaminated groundwater has been pumped and discharged to the local wastewater treatment plant. Since August 1996 soil vapor extraction (SVE) of the major VOC source areas has effectively removed approximately 12,500 pounds of VOCs. During the period between 1994 and 2000, approximately 500,000 tons of impacted soil was removed from the site, and as much as 230,000 cubic yards of moderately impacted soil has been approved for consolidation in an on-site landfill currently under construction in the northwest corner of the property. The Central Valley Water Board is supporting the DTSC in the oversight of this cleanup. For more detailed information about the Railyards, please look under the individual SCP-sub areas. DTSC is lead designated agency. Water Board is lead support agency.

Click here to access the California GeoTracker records for this facility:

Region:	STATE
Facility Status:	**Open - Site Assessment**
Status Date:	12/17/1981
Global Id:	SL205072992
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	34400011
Latitude:	38.583191
Longitude:	-121.498593
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992
File Location:	Regional Board
Potential Media Affected:	Aquifer used for drinking water supply, Indoor Air, Sediments, Soil, Soil Vapor, Under Investigation
Potential Contaminants of Concern:	Benzene, Other Solvent or Non-Petroleum Hydrocarbon, Tetrachloroethylene (PCE), Trichloroethylene (TCE), Vinyl chloride, Lead, Nickel, Crude Oil, Diesel, Gasoline
Site History:	The Downtown Sacramento Railyard is an approximately 240-acre site that was used for heavy industrial activities to maintain and repair trains. Groundwater is polluted with solvents (chlorinated volatile organic compounds or VOCs), metals and petroleum hydrocarbons that currently measure approximately a half-mile long. Since March 1993 approximately 650 gallons of pure liquid phase fuel has been removed by bailing activities from the wells at the site. Since May 1995 approximately 400,000 gallons a day of polluted groundwater is pumped and treated to control migration and reduce concentrations. To date, approximately 840,000,000 gallons of contaminated groundwater has been pumped and discharged to the local wastewater treatment plant. Since August 1996 soil vapor extraction (SVE) of the major VOC source areas has effectively removed approximately 12,500 pounds of VOCs. During the period between 1994 and 2000, approximately 500,000 tons of impacted soil was removed from the site, and as much as 230,000 cubic yards of moderately impacted soil has been approved for consolidation in an on-site landfill currently under construction in the northwest corner of the property. The Central Valley Water Board is supporting the DTSC in the oversight of this cleanup. For more detailed information about the Railyards, please look under the individual SCP-sub areas. DTSC is lead designated agency. Water Board is lead support agency.

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Click here to access the California GeoTracker records for this facility:

Region:	STATE
Facility Status:	**Open - Remediation**
Status Date:	02/25/2013
Global Id:	T10000001979
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	34400006
Latitude:	38.5852434460477
Longitude:	-121.498854160309
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992
File Location:	DTSC
Potential Media Affected:	Soil
Potential Contaminants of Concern:	Not reported
Site History:	The Southern Pacific Transportation Company's (SPTCo) Sacramento Railyard Facility has been in operation since 1865. The site is approximately 240 acres. Inorganic and organic contamination are broadly distributed across a majority of the site. Additionally, liquid waste was historically disposed of in an industrial sewer system constructed over 100 years ago. On June 2, 1988, the Department and SPTCo entered into an Enforceable Agreement. A workplan and schedule for investigation and cleanup was finalized in October of 1988. Based on historical usage and known contamination the site was divided into six study areas: Central Shops and, Central Corridor, Car Shops Nine, Lagoon, Northern Shops, and Sacramento Station. The Sacramento Station was used as a wheel foundry and depot. The soil was contaminated with metals and Total Petroleum Hydro- carbons (TPH). Groundwater contamination includes metals and Semi Volatile Organic Compounds and Total Petroleum Hydrocarbons TPH. Closure is for Soils only. Groundwater is being addressed as Site Wide cleanup for North and/or South Plume Groundwater Study Areas. DTSC is lead designated agency - Water Board is lead support agency 2/19/2013 - 9,000 gallon UST discovered during road work and excavation. 2/25/2013 - UST removed and some excavation occurred under 6th St ROW. Currently assessing extent of impact.

Click here to access the California GeoTracker records for this facility:

Region:	STATE
Facility Status:	**Open - Verification Monitoring**
Status Date:	06/03/1992
Global Id:	T10000001965
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	34400007
Latitude:	38.5865349598476
Longitude:	-121.499905586243
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992
File Location:	DTSC
Potential Media Affected:	Aquifer used for drinking water supply, Indoor Air, Other Groundwater (uses other than drinking water), Soil, Soil Vapor

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Potential Contaminants of Concern: Acetone, Other Chlorinated Hydrocarbons, Other Solvent or Non-Petroleum Hydrocarbon, Lead, Diesel, Other Petroleum, Waste Oil / Motor / Hydraulic / Lubricating, Polynuclear aromatic hydrocarbons (PAHs)

Site History: The Southern Pacific Transportation Company's (SPTCo) Sacramento Railyard Facility has been in operation since 1865. The site is approximately 240 acres. Inorganic and organic contamination are broadly distributed across a majority of the site. Additionally, liquid waste was historically disposed of in an industrial sewer system constructed over 100 years ago. On June 2, 1988, the Department and SPTCo entered into an Enforceable Agreement. A workplan and schedule for investigation and cleanup was finalized in October of 1988. Based on historical usage and known contamination the site was divided into six study areas: Central Shops (CSSA), Central Corridor (CCSA), Car Shop (CSNSA), and Sacramento Station (SSSA). The Northern Shops Study Area consisted of storage buildings, a Frog Shop, Spring shop, Brass Foundry and a Drum Storage Area (a seperate RCRA unit) were unknown types and amounts of chemical were disposed of and stored on the ground. Soil contamination includes metals, Volatile Organic Compounds (VOC's), Semi Volatile Organic Compounds (SVOC's) including Poly Nuclear Aromatics (PAH's), and Total Petroleum Hydrocarbons (TPH). Groundwater contamination includes metals, VOC's, SVOC's, and TPH. Soil Only Cleanup. Groundwater being addressed in North and/or South Plume Ground water Study Area. DTSC is lead designated agency - Water Board is lead support agency

Click here to access the California GeoTracker records for this facility:

Region: STATE
Facility Status: **Open - Verification Monitoring**
Status Date: 04/09/1998
Global Id: T10000001959
Lead Agency: CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number: 34360065
Latitude: 38.5891682342013
Longitude: -121.50130033493
Case Type: Cleanup Program Site
Case Worker: BSS
Local Agency: Not reported
RB Case Number: SL205072992
File Location: DTSC
Potential Media Affected: Not reported
Potential Contaminants of Concern: Not reported
Site History: The Southern Pacific Transportation Company's (SPTCo) Sacramento Railyard Facility has been in operation since 1865. The site is approximately 240 acres. Inorganic and organic contamination are broadly distributed across a majority of the site. Additionally, liquid waste was historically disposed of in an industrial sewer system constructed over 100 years ago. On June 2, 1988, the Department and SPTCo entered into an Enforceable Agreement. A workplan and schedule for investigation and cleanup was finalized in October of 1988. Based on historical usage and known contamination the site was divided into six study areas: Central Shops and, Central Corridor, Car Shops Nine, Lagoon, Northern Shops, and Sacramento Station. The Battery Shop Yard consisted of battery storage building, associated outside storage yard, and dry well in which waste acid was

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

poured. This site was designated as a RCRA Interim Status Solid Waste Management Unit in 1985. Investigations were conducted in 1987 and 1988 to determine the extent of contamination, which was found to be primarily from metals. Groundwater monitoring and reporting related to closure and post-closure of the unit was conducted until 1998. Estimated size of Battery shop area is ~ 1 ACRE Soil closure granted by Dept of Health Services in 1990, Groundwater is being addressed as seperate operable units (OUs) -Lagoon Groundwater Study Area and/or South Plume Groundwater Study Areas. Human health exposures controlled by deed restrictions. DTSC is lead designated agency - Water Board is lead support agency

Click here to access the California GeoTracker records for this facility:

Region:	STATE
Facility Status:	**Open - Remediation**
Status Date:	03/18/2013
Global Id:	T10000001833
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	34400008
Latitude:	38.5894701320968
Longitude:	-121.496901512146
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992
File Location:	DTSC
Potential Media Affected:	Aquifer used for drinking water supply, Other Groundwater (uses other than drinking water), Soil
Potential Contaminants of Concern:	Other Chlorinated Hydrocarbons, Trichloroethylene (TCE), Vinyl chloride, Arsenic, Lead, Diesel, Gasoline, Waste Oil / Motor / Hydraulic / Lubricating, Polynuclear aromatic hydrocarbons (PAHs)
Site History:	Soil Cleanup Only. Groundwater being addressed under Lagoon Groundwater Study Area. The Southern Pacific Transportation Company's (SPTCo) Sacramento Railyard Facility has been in operation since 1865. The site is approximately 240 acres. Inorganic and organic contamination are broadly distributed across a majority of the site. Additionally, liquid waste was historically disposed of in an industrial sewer system constructed over 100 years ago. On June 2, 1988, the Department and SPTCo entered into an Enforceable Agreement. A workplan and schedule for investigatio and cleanup was finalized in October of 1988. Based on historical usage and known contamination the site was divided into six study areas: Central Shops (CSSA), Central Corridor (CCSA), Car Shop Nine (CSNSA), Lagoon (LSA), Northern Shops (NSSA) and Sacramento Station (SSSA). The Lagoon Study Area contains the former industrial waste water lagoon, an API oil/water separator overflow area, and the former location of a 50,000 gallon barrel oil storage tank. The soil and groundwater are extensively contaminated. Soil contamination includes metals, Volatile Organic Compounds (VOC's), Semi Volatile Organic Compounds (SVOC's) including Poly Nuclear Aromatics (PAH's), and total Petroleum Hydrocarbons (TPH). Groundwater contamination includes metals, VOC's, SVOC's, and TPH. Active removal of impacted soil vapor and groundwater has occurred at portions of the LSA, such as the former Drum Storage Area (DSA). Approval of plans to safely dispose of inert soils beneath an engineered cap and vegetative cover in the Northwest Corner was granted in March 2007, and construction is

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

currently underway. Date of Human Health Exposure control given as sate for Deed restriction date 7/11/2001. Soil Remedy has been started (excavations) and continues. Groundwater is being addressed outside of Lagoon study area in Lagoon Groundwater Study Area and/or South Plume Groundwater Study Areas. DTSC is lead designated agency - Water Board is lead support agency

Click here to access the California GeoTracker records for this facility:

Region:	STATE
Facility Status:	**Open - Assessment & Interim Remedial Action**
Status Date:	07/01/2010
Global Id:	T10000001962
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	34400010
Latitude:	38.5855285874561
Longitude:	-121.501815319061
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992
File Location:	DTSC
Potential Media Affected:	Not reported
Potential Contaminants of Concern:	Not reported
Site History:	Soils Only Case, Groundwater being handled under South Plume Study Area. The Central Corridor was used for boxcar cleaning, boxcar dismantling, boxcar sandblasting, and a saw mill utilized for lumber milling planing and woodworking. The soil is contaminated wth metals, Volatile Organic Compounds (VOC's), Semi Volatile Organic Compounds (SVOC's), Poly Nuclear Aromatics (PAH's), and Total Petroleum Hydrocarbons (TPH). Groundwater contamination includes metals, VOC's, SVOC's, and Total Petroleum Hydrocarbons TPH. Human Health Exposure controlled through deed restrictions DTSC is lead designated agency - Water Board is lead support agency

Click here to access the California GeoTracker records for this facility:

Region:	STATE
Facility Status:	**Open - Remediation**
Status Date:	05/07/2003
Global Id:	T10000001977
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	34400005
Latitude:	38.5882793052488
Longitude:	-121.502201557159
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992
File Location:	DTSC
Potential Media Affected:	Aquifer used for drinking water supply, Indoor Air, Soil, Soil Vapor
Potential Contaminants of Concern:	Acetone, Benzene, Other Solvent or Non-Petroleum Hydrocarbon, Toluene, Xylene, Other Insecticides / Pesticide / Fumigants / Herbicides, Arsenic, Lead, Diesel, Gasoline, Waste Oil / Motor / Hydraulic / Lubricating
Site History:	The Ponds and Ditch consisted of the industrial wastewater disposal ponds and a ditch to convey wastewater to the Sacramento regional

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

sewer system. Soils contaminated with metals, Volatile Organic Compounds (VOC's), Semi Volatile Organic Compounds (SVOC's), and Poly Nuclear Aromatics (PAH's) were remediated in May 1993. Groundwater contamination includes metals, and VOC's. This site was designated a RCRA Interim Status Waste Management Unit in 1985. DTSC is lead designated agency - Water Board is lead support agency

Click here to access the California GeoTracker records for this facility:

Region:	STATE
Facility Status:	**Completed - Case Closed**
Status Date:	06/22/1990
Global Id:	T10000001980
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	34320031
Latitude:	38.585099
Longitude:	-121.502199
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992
File Location:	DTSC
Potential Media Affected:	Soil
Potential Contaminants of Concern:	Lead
Site History:	The Sand Piles Site was the location on the Southern Pacific Transportation company's Sacramento facility at which spent sand blasting grit was stored. Spent sand blasting material is now placed in drums and handled as hazardous waste. Remediation of the Site included the recycling of, as a component of asphalt, 2,341 tons of sand. Additionally 897 tons of material was disposed of at a Class I landfill and 236 tons of concrete, wood, and metal debris was disposed of at a Class III landfill. The Department's goal for cleanup was to achieve a level of total lead in the soils below 950 mg of lead/kg of soil. This goal was met. Levels of lead exceeding the STLC of 5.0 mg of lead/kg have been found at and adjacent to the to the previous location of the sand piles. The Department has determined that the remaining contamination is part of a general overall condition at the facility. This contamination will be addressed as part of the overall site investigation and remediation. Soil closure only -DTSC. Groundwater being addressed seperately as Site Wide issue in North and/or South Plume Groundwater Study Areas. DTSC is lead designated agency - Water Board is lead support agency

Click here to access the California GeoTracker records for this facility:

Region:	STATE
Facility Status:	**Open - Assessment & Interim Remedial Action**
Status Date:	06/30/2010
Global Id:	T10000001834
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	34400009
Latitude:	38.589503676229
Longitude:	-121.492781639099
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

File Location: DTSC
Potential Media Affected: Not reported
Potential Contaminants of Concern: Not reported
Site History: The Southern Pacific Transportation Company's (SPTCo) Sacramento Railyard Facility has been in operation since 1865. The site is approximately 240 acres. Inorganic and organic contamination are broadly distributed across a majority of the site. Additionally, liquid waste was historically disposed of in an industrial sewer system constructed over 100 years ago. On June 2, 1988, the Department and SPTCo entered into an Enforceable Agreement. A workplan and schedule for investigation and cleanup was finalized in October of 1988. Based on historical usage and known contamination the site was divided into six study areas: Central Shops (CSSA), Central Corridor (CCSA), Carshop Nine (CSNSA), Lagoon (LSA), Northern Shops (NSSA), and Sacramento Station (SSSA). The Car Shop Nine was utilized for constructing rail cars, painting rail cars, sandblasting, general offices, and rail yard operations building. Five UST's were located in Car Shop Nine. The soil is contaminated with metals, Volatile Organic Compounds (VOC's), Semi Volatile Organic Compounds (SVOC's), Poly Nuclear Aromatics (PAH's), and Total Petroleum Hydrocarbons (TPH). Groundwater contamination includes metals, VOC's, and Total Petroleum Hydrocarbons TPH. Soil Cleanup only. Groundwater Plume being addressed as seperate OU -South and/or North Groundwater Plume Areas. DTSC recorded a deed restriction for future use. For deed restrictions visit Envirostore @ http://www.envirostor.dtsc.ca.gov/public/profile_report.asp?global_id= 34400009 Final Soil Remedy was implemented after May 2000. However, recent soil gas results being investigated further. DTSC is lead designated agency - Water Board is lead support agency

Click here to access the California GeoTracker records for this facility:

Region: STATE
Facility Status: **Open - Verification Monitoring**
Status Date: 11/20/2013
Global Id: T10000005279
Lead Agency: CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number: Not reported
Latitude: 38.5853608483894
Longitude: -121.497030303149
Case Type: Cleanup Program Site
Case Worker: BSS
Local Agency: Not reported
RB Case Number: SL205072992
File Location: Not reported
Potential Media Affected: Other Groundwater (uses other than drinking water), Soil
Potential Contaminants of Concern: Not reported
Site History: An approximately 9,000 gallon UST was discovered in February 2013 by the City of Sacramento during construction of the 6th St extension. At the time it was discovered, the tank contained approximately 6,900 gallons of water, residual bunker oil, and debris such as bricks, wood, and soil. The tank was removed by the City of Sacramento and over excavation of impacted soil was performed by the City and UPRR. The Downtown Sacramento Railyard is an approximately 240-acre site that was used for heavy industrial activities to maintain and repair trains. Groundwater is polluted with solvents (chlorinated volatile organic compounds or VOCs), metals and petroleum hydrocarbons that in

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

a multi-zone plume currently approximately a half-mile long. Since March 1993 approximately 650 gallons of pure liquid phase fuel has been removed by bailing activities from the wells at the site. Since May 1995 approximately 400,000 gallons a day of polluted groundwater is pumped and treated to control migration and reduce concentrations. To date, approximately 840,000,000 gallons of contaminated groundwater has been pumped and discharged to the local wastewater treatment plant. Since August 1996 soil vapor extraction (SVE) of the major VOC source areas has effectively removed approximately 12,500 pounds of VOCs. During the period between 1994 and 2000, approximately 500,000 tons of impacted soil was removed from the site, and as much as 230,000 cubic yards of moderately impacted soil has been approved for consolidation in an on-site landfill currently under construction in the northwest corner of the property. The Central Valley Water Board is supporting the DTSC in the oversight of this cleanup. For more detailed information about the Railyards, please look under the individual SCP-sub areas. DTSC is lead designated agency. Water Board is lead support agency.

Click here to access the California GeoTracker records for this facility:

Region:	STATE
Facility Status:	**Open - Remediation**
Status Date:	03/18/2013
Global Id:	T10000001982
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	34400008
Latitude:	38.591432437476
Longitude:	-121.498382091522
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992
File Location:	DTSC
Potential Media Affected:	Aquifer used for drinking water supply, Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	1,1,1-Trichloroethane (TCA), Benzene, Other Chlorinated Hydrocarbons, Other Solvent or Non-Petroleum Hydrocarbon, Tetrachloroethylene (PCE), Toluene, Trichloroethylene (TCE), Vinyl chloride, Xylene, Arsenic, Lead, Diesel, Gasoline, Other Petroleum, Waste Oil / Motor / Hydraulic / Lubricating, Polynuclear aromatic hydrocarbons (PAHs)
Site History:	The Lagoon Groundwater Study Area includes the aquifer beneath the former industrial waste water lagoon, an API oil/water separator overflow area, and the former location of a 50,000 gallon barrel oil storage tank. The soil and groundwater are extensively contaminated. Soil contamination includes metals, Volatile Organic Compounds (VOC's), Semi Volatile Organic Compounds (SVOC's) including Poly Nuclear Aromatics (PAH's), and total Petroleum Hydrocarbons (TPH). Groundwater contamination includes metals, VOC's, SVOC's, and TPH. Active removal of impacted soil vapor and groundwater has occurred at portions of the LSA, such as the former Drum Storage Area (DSA). Approval of plans to safely dispose of inert soils beneath an engineered cap and vegetative cover in the Northwest Corner was granted in March 2007, and construction is currently underway. Groundwater Cleanup Only DTSC is lead designated agency - Water Board is lead support agency 3/18/2013 - Removal of petroleum impacted soils and groundwater began underneath Former Track 150 alignment

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

south to Central Shops.

Click here to access the California GeoTracker records for this facility:

Region:	STATE
Facility Status:	**Open - Assessment & Interim Remedial Action**
Status Date:	05/12/1995
Global Id:	T10000001832
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	34400004
Latitude:	38.5872268326853
Longitude:	-121.500447392464
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992
File Location:	DTSC
Potential Media Affected:	Not reported
Potential Contaminants of Concern:	Not reported
Site History:	The Southern Pacific Transportation Company's (SPTCo) Sacramento Railyard Facility has been in operation since 1865. The site is approximately 240 acres. Inorganic and organic contamination are broadly distributed across a majority of the site. Additionally, liquid waste was historically disposed of in an industrial sewer system constructed over 100 years ago. On June 2, 1988, the Department and SPTCo entered into an Enforceable Agreement. A workplan and schedule for investigation and cleanup was finalized in October of 1988. Based on historical usage and known contamination the site was divided into six study areas: Central Shops (CSSA), Central Corridor (CCSA), Carshop Nine (CSNSA), Lagoon (LSA), Northern Shops (NSSA), and Sacramento Station (SSSA). The Car Shop Nine was utilized for constructing rail cars, painting rail cars, sandblasting, general offices, and rail yard operations building. Five UST's were located in Car Shop Nine. The soil is contaminated with metals, Volatile Organic Compounds (VOC's), Semi Volatile Organic Compounds (SVOC's), Poly Nuclear Aromatics (PAH's), and Total Petroleum Hydrocarbons (TPH). Groundwater contamination includes metals, VOC's, and Total Petroleum Hydrocarbons TPH. Please also look in EnviroStore at: http://www.envirostor.dtsc.ca.gov/public/profile_report.asp?global_id= 34400009

Click here to access the California GeoTracker records for this facility:

Region:	STATE
Facility Status:	**Open - Remediation**
Status Date:	11/20/2013
Global Id:	T10000005282
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	Not reported
Latitude:	38.5900739151165
Longitude:	-121.495485350757
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992
File Location:	Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Potential Media Affected:	Not reported
Potential Contaminants of Concern:	Not reported
Site History:	During construction of Railyards Boulevard, a contractor discovered an UST with an approximate capacity of 3,500 gallons buried below the ground surface. The UST contained soil and liquid exhibiting a strong odor. The contents of the UST are pending characterization. The Downtown Sacramento Railyard is an approximately 240-acre site that was used for heavy industrial activities to maintain and repair trains. Groundwater is polluted with solvents (chlorinated volatile organic compounds or VOCs), metals and petroleum hydrocarbons that in a multi-zone plume currently approximately a half-mile long. Since March 1993 approximately 650 gallons of pure liquid phase fuel has been removed by bailing activities from the wells at the site. Since May 1995 approximately 400,000 gallons a day of polluted groundwater is pumped and treated to control migration and reduce concentrations. To date, approximately 840,000,000 gallons of contaminated groundwater has been pumped and discharged to the local wastewater treatment plant. Since August 1996 soil vapor extraction (SVE) of the major VOC source areas has effectively removed approximately 12,500 pounds of VOCs. During the period between 1994 and 2000, approximately 500,000 tons of impacted soil was removed from the site, and as much as 230,000 cubic yards of moderately impacted soil has been approved for consolidation in an on-site landfill currently under construction in the northwest corner of the property. The Central Valley Water Board is supporting the DTSC in the oversight of this cleanup. For more detailed information about the Railyards, please look under the individual SCP-sub areas. DTSC is lead designated agency. Water Board is lead support agency.

Click here to access the California GeoTracker records for this facility:

Region:	STATE
Facility Status:	**Open - Assessment & Interim Remedial Action**
Status Date:	10/30/1995
Global Id:	T10000001981
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	Not reported
Latitude:	38.5847737989069
Longitude:	-121.498489379883
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992
File Location:	DTSC
Potential Media Affected:	Aquifer used for drinking water supply, Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	1,1,1-Trichloroethane (TCA), Acetone, Benzene, Other Chlorinated Hydrocarbons, Other Solvent or Non-Petroleum Hydrocarbon, Tetrachloroethylene (PCE), Toluene, Trichloroethylene (TCE), Vinyl chloride, Xylene, Diesel, Gasoline, Other Petroleum, Waste Oil / Motor / Hydraulic / Lubricating, Polynuclear aromatic hydrocarbons (PAHs)
Site History:	South Plume Groundwater Study Area extends from north of the Central Shops south down to P Street. The groundwater impacts consist of both onsite and offsite contaminant plumes. A significant dissolved phase chlorinated VOC plume extends offsite to the south, beneath downtown Sacramento to approximately P Street. Impacted groundwater is being actively pumped and treated both onsite and near the southern

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

terminus of the plume, at a rate of approximately 400,000 gallons a day. Onsite Soil Vapor Extraction (SVE) of the major VOC source areas is also ongoing. Groundwater Only. Soils Not Applicable - soils addressed separately on Site. DTSC is lead designated agency - Water Board is lead support agency

Click here to access the California GeoTracker records for this facility:

Region:	STATE
Facility Status:	**Open - Assessment & Interim Remedial Action**
Status Date:	01/01/2003
Global Id:	T10000001983
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	70000034
Latitude:	38.5876084081861
Longitude:	-121.504218578339
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205072992
File Location:	DTSC
Potential Media Affected:	Aquifer used for drinking water supply, Other Groundwater (uses other than drinking water), Soil
Potential Contaminants of Concern:	1,1,1-Trichloroethane (TCA), Acetone, Benzene, Toluene, Xylene, Arsenic, Lead, Diesel, Gasoline, Waste Oil / Motor / Hydraulic / Lubricating, Polynuclear aromatic hydrocarbons (PAHs)
Site History:	The Manufactured Gas Plant (MGP) Area was added in 2003, which was established after discovering remnants of an MGP on the western boundary of the northern shops area during soil remediation activities in the Northern Shops area. This plant was in operation during the late 1800's. Soil and groundwater at the MGP Area are both impacted. Soil contamination includes metals, TPH, Volatile Organic Compounds (VOC's) with the highest concentrations detected of benzene, and Semi Volatile Organic Compounds (SVOC's) primarily consisting of napththalene and B(a)P. Groundwater COCs include benzene, napththlene, B(a)P and TPH. Soil Only. Ground water being addressed in South Plume or Lagoon Groundwater Study Areas. DTSC is lead designated agency - Water Board is lead support agency

Click here to access the California GeoTracker records for this facility:

SLIC REG 5:

Region:	5
Facility Status:	R I/FS/REM
Unit:	Facility is a Spill or site
Pollutant:	VOCs ,TPH, metals
Lead Agency:	WTE
Date Filed:	/ /
Report Date:	/ /
Date Added:	Not reported
Date Closed:	Not reported

Sacramento Co. CS:

State Site Number:	DT002
Lead Staff:	None assigned, H.
Lead Agency:	RW

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Remedial Action Taken: NO
Substance: Not reported
Date Reported: Not reported
Facility Id: RO0000635
Case Type: Not reported
Case Closed: Not reported
Date Closed: Not reported

DEED:
Envirostor ID: T10000001979
Area: Not reported
Sub Area: Not reported
Site Type: SLIC
Status: OPEN - REMEDIATION
Agency: SWRCB
Covenant Uploaded: Y
Deed Date(s): 05/19/1994

Envirostor ID: T10000001959
Area: Not reported
Sub Area: Not reported
Site Type: SLIC
Status: OPEN - VERIFICATION MONITORING
Agency: SWRCB
Covenant Uploaded: Y
Deed Date(s): 06/28/1990

Envirostor ID: SL205072992
Area: Not reported
Sub Area: Not reported
Site Type: SLIC
Status: OPEN - SITE ASSESSMENT
Agency: SWRCB
Covenant Uploaded: Y
Deed Date(s): 07/01/2001

Envirostor ID: 34400009
Area: PROJECT WIDE
Sub Area: Not reported
Site Type: STATE RESPONSE
Status: ACTIVE
Agency: Not reported
Covenant Uploaded: Not reported
Deed Date(s): 07/11/2001

Envirostor ID: 34400008
Area: 7TH STREET CORRIDOR
Sub Area: Not reported
Site Type: STATE RESPONSE
Status: ACTIVE
Agency: Not reported
Covenant Uploaded: Not reported
Deed Date(s): 07/11/2001

Envirostor ID: 34400005
Area: PROJECT WIDE
Sub Area: Not reported

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Site Type: STATE RESPONSE
Status: CERTIFIED / OPERATION & MAINTENANCE
Agency: Not reported
Covenant Uploaded: Not reported
Deed Date(s): 05/19/1994

Envirostor ID: 34360065
Area: PROJECT WIDE
Sub Area: Not reported
Site Type: STATE RESPONSE
Status: CERTIFIED O&M - LAND USE RESTRICTIONS ONLY
Agency: Not reported
Covenant Uploaded: Not reported
Deed Date(s): 06/28/1990

Envirostor ID: 34400006
Area: PROJECT WIDE
Sub Area: Not reported
Site Type: STATE RESPONSE
Status: CERTIFIED O&M - LAND USE RESTRICTIONS ONLY
Agency: Not reported
Covenant Uploaded: Not reported
Deed Date(s): 05/19/1994

Envirostor ID: T10000001834
Area: Not reported
Sub Area: Not reported
Site Type: SLIC
Status: OPEN - ASSESSMENT & INTERIM REMEDIAL ACTION
Agency: SWRCB
Covenant Uploaded: Y
Deed Date(s): 07/11/2001

VCP:
Facility ID: 34400011
Site Type: Voluntary Cleanup
Site Type Detail: Voluntary Cleanup
Site Mgmt. Req.: NONE SPECIFIED
Acres: 240
National Priorities List: NO
Cleanup Oversight Agencies: SMBRP
Lead Agency: SMBRP
Lead Agency Description: DTSC - Site Cleanup Program
Project Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Site Code: 100552
Assembly: 07
Senate: 06
Special Programs Code: Voluntary Cleanup Program
Status: Active
Status Date: 02/09/1995
Restricted Use: NO
Funding: Responsible Party
Lat/Long: 38.58448 / -121.5010
APN: 00200100440000
Past Use: RAIL ROAD MAINTENANCE SHOP

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Potential COC: 30013, 30019, 30024, 30025, 3002502, 30027, 30028
Confirmed COC: 30013,30019,30024,30025,30027,30028,3002502
Potential Description: SOIL
Alias Name: SOUTHERN PACIFIC TRANSPORTATION CO.
Alias Type: Alternate Name
Alias Name: SP, SAC - REDEVELOPMENT
Alias Type: Alternate Name
Alias Name: 00200100440000
Alias Type: APN
Alias Name: CAD073772030
Alias Type: EPA Identification Number
Alias Name: 110012532170
Alias Type: EPA (FRS #)
Alias Name: 110033620295
Alias Type: EPA (FRS #)
Alias Name: SL205072992
Alias Type: GeoTracker Global ID
Alias Name: 100552
Alias Type: Project Code (Site Code)
Alias Name: 34400011
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Memorandum of Agreement - IAG
Completed Date: 02/22/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 02/22/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 10/12/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 07/31/2000
Comments: 2000 Environmental Oversight Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Deed/LUR Enforcement & Implementation Plan
Completed Date: 12/13/1994
Comments: 1994 Memorandum of Understanding

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 01/05/1995
Comments: The City of Sacramento, SPT Co, and the DTSC signed a Memorandum of

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Understanding (MOU) concerning remediation and redevelopment of the Sacramento Locomotive Works, Sacramento, California. The MOU was implemented to enable orderly and timely remediation and redevelopment of the railyards in a manner fully protective of human health and the environment.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 04/18/2008
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

Facility ID: 60001652
Site Type: Voluntary Cleanup
Site Type Detail: Voluntary Cleanup
Site Mgmt. Req.: NONE SPECIFIED
Acres: 240
National Priorities List: NO
Cleanup Oversight Agencies: SMBRP
Lead Agency: SMBRP
Lead Agency Description: DTSC - Site Cleanup Program
Project Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Site Code: 102186
Assembly: 07
Senate: 06
Special Programs Code: Voluntary Cleanup Program
Status: Active
Status Date: 03/01/2012
Restricted Use: NO
Funding: Responsible Party
Lat/Long: 38.58712 / -121.4998
APN: NONE SPECIFIED
Past Use: RAIL ROAD MAINTENANCE SHOP, RAILROAD RIGHT OF WAY
Potential COC: 30001, 30013, 30024, 3002502
Confirmed COC: 30001,30013,30024,3002502
Potential Description: SOIL, SV
Alias Name: 102186
Alias Type: Project Code (Site Code)
Alias Name: 60001652
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 11/01/2012

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Comments: Resolved. No documents submitted. Inland entered into a cost recovery agreement with DTSC to continue with biweekly consultation meetings.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consultative Service Agreement
Completed Date: 06/24/2014
Comments: DTSC letter sent to IAH on 6/24/2014. Agreement for DTSC oversight scope of work and reimbursement.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consultative Service Agreement
Completed Date: 06/26/2014
Comments: Amendment to change end date. Agreement for DTSC oversight scope of work and reimbursement.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consultative Service Agreement
Completed Date: 07/24/2012
Comments: DGS executed agreement on 7/20/2012. DTSC letter sent to IAH on 7/24/2012.

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Land Use Restriction
Future Due Date: 2015
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

Sacramento Co. ML:
Facility Id: U0027386
Facility Status: Inactive. Included on a listing no longer updated.
FD: U
Billing Codes BP: Out of Business
Billing Codes UST: No Tanks
WG Bill Code: Oil Changed by Outside Company-No Fee
Target Property Bill Cod: 51
Food Bill Code: 51
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: Not reported
UST Permit Dt: 11/18/1987
UST Inspection Date: 02/27/1991
UST Tank Test Date: 02/13/1989
Number of Tanks: 0
UST Tank Test Date: Not reported
SIC Code: Not reported
Tier Permitting: Not reported
AST Bill Code: Not reported
CALARP Bill Code: Not reported

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Facility Id:	U0027386
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	11/18/1987
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	4011
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

RESPONSE:

Facility ID:	34360065
Site Type:	State Response
Site Type Detail:	State Response or NPL
Acres:	1
National Priorities List:	NO
Cleanup Oversight Agencies:	HWMP, SMBRP, RWQCB 5R - Central Valley
Lead Agency Description:	Not reported
Project Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Site Code:	100139
Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	07
Senate:	06
Special Program Status:	Not reported
Status:	Certified O&M - Land Use Restrictions Only
Status Date:	10/04/2010
Restricted Use:	YES
Funding:	Responsible Party
Latitude:	38.58869
Longitude:	-121.5014
APN:	00200100440000
Past Use:	BATTERY STORAGE
Potential COC :	* CONTAMINATED SOIL * ACID SOLUTION 2>PH WITH METALS Lead Nickel
Confirmed COC:	NONE SPECIFIED
Potential Description:	SOIL
Alias Name:	SACRAMENTO RAILYARD FACILITY
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC TRANSPORTATION COMPANY
Alias Type:	Alternate Name
Alias Name:	SP, SAC - BATTERY SHOP YARD
Alias Type:	Alternate Name
Alias Name:	SP-SAC - BATTERY SHOP
Alias Type:	Alternate Name

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Alias Name: SP-SAC - LOCOMOTIVE WORKS
Alias Type: Alternate Name
Alias Name: SP-SAC - OVERALL SITE
Alias Type: Alternate Name
Alias Name: UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type: Alternate Name
Alias Name: 00200100440000
Alias Type: APN
Alias Name: CAD073772030
Alias Type: EPA Identification Number
Alias Name: 110000609770
Alias Type: EPA (FRS #)
Alias Name: 110012532170
Alias Type: EPA (FRS #)
Alias Name: 110033620295
Alias Type: EPA (FRS #)
Alias Name: T10000001959
Alias Type: GeoTracker Global ID
Alias Name: 100227
Alias Type: Site Code - Historical
Alias Name: 100139
Alias Type: Project Code (Site Code)
Alias Name: 34360065
Alias Type: Envirostor ID Number
Alias Name: 34400004
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: 5 Year Review Reports
Completed Date: 04/09/1998
Comments: 5YEAR -- THE 5-YEAR REVIEW FOR THE SOUTHERN PACIFIC TRANSPORTATION COMPANY, SACRAMENTO (SPTCO) BATTERY SHOPS STUDY AREA (BSSA) HAS BEEN REVIEWED AND APPROVED BY THE DEPARTMENT. THE REPORT WAS COMPLETED AS A TYPE IA REVIEW, AS RECOMMENDED BY DTSC AND CONSISTENT WITH OSWER DIRECTIVE 9355.7-02A. THE IA REVIEWS ARE APPLICABLE FOR SITES WHERE CLOSURE IS NOT COMPLETE AND NO SPECIAL CIRCUMSTANCES HAVE ARISEN SINCE THE REMEDIAL ACTION WAS PERFORMED THE BSSA SOILS WERE EXCAVATED AND DISPOSED OF OFFSITE TO REMEDIAT LEAD, CHROMIUM, AND ARSENIC SOIL CONTAMINATION FROM DISPOSAL OF SPENT BATTERY ACID INTO ONSITE DRY WELLS. AS PART OF THE APRIL 1990 FINAL REMEDIAL ACTION PLAN FOR BSSA, SPTCO WAS REQUIRED TO INSTALL AND MONITOR 5 GROUNDWATER MONITORING WELLS IN THE UPPER SAND ZONE TO EVALUATE THE POTENTIAL SOIL CONTAMINATION FROM THE BSSA IMPACTING GROUNDWATER. BASED ON THE REVIEW OF THE GROUND WATER MONITORING DATA, THE REMEDIATION PERFORMED FOR THE BSSA IS MEETING THE OBJECTIVE OF THE BSSA RAP/CP.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 06/25/1990
Comments: The DTSC approved the Closure Report for the Former Battery Shop Yard, Sacramento Locomotive Works dated June 18, 1990

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan

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Completed Date: 04/26/1990
Comments: The Final RAP /Closure Plan (RAP/CP) for the Battery Shops has been adopted and DTSC determined the that the RAP/COP satisfactorily addresses all applicable state and federal statutes and regulations.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/09/2010
Comments: Issued response on 11/9/2010.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/19/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/29/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 06/02/1988
Comments: DHS gives Remedial Action Order.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 06/28/1990
Comments: The deed restriction allows all uses of the property, although if the property is to be used for residential or educational purposes at ground level or the public as unimproved land (eg., park, open space, gardening), the owners and occupants shall take action so that public is not exposed to concentrations of lead greater than 174 mg/kg (or other standard determined by the Department to be protective of public health and the environment). The deed restriction limits excavation and disposal of soil without Department approval, and does not allow disturbance of the 2-foot clean soil cap.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 06/25/1990
Comments: Certified. Excavation and disposal of 262 tons of soil at class I landfill. Cleanup level of 950 mg of lead/kg soil was met.

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: 5 Year Review Reports
Future Due Date: 2020
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: 5 Year Review Reports

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Schedule Due Date:	06/30/2015
Schedule Revised Date:	Not reported
Facility ID:	34400004
Site Type:	State Response
Site Type Detail:	State Response or NPL
Acres:	31
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP, RWQCB 5R - Central Valley
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Site Code:	100139
Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	07
Senate:	06
Special Program Status:	* RCRA 3012 - Past Haz Waste Disp Inven Site
Status:	Active
Status Date:	01/01/1983
Restricted Use:	NO
Funding:	Responsible Party
Latitude:	38.58585
Longitude:	-121.5016
APN:	00200100440000
Past Use:	RAIL ROAD MAINTENANCE SHOP, RAILROAD RIGHT OF WAY
Potential COC :	* OIL/WATER SEPARATION SLUDGE * DETERGENT & SOAP * ACID SOLUTION 2>PH WITH METALS * ALKALINE SOLUTION WITHOUT METALS Asbestos Containing Materials (ACM * Sludge - Paint * UNSPECIFIED ACID SOLUTION * UNSPECIFIED AQUEOUS SOLUTION * UNSPECIFIED OIL CONTAINING WASTE * UNSPECIFIED SOLVENT MIXTURES * OTHER INORGANIC SOLID WASTE Benzene Polynuclear aromatic hydrocarbons (PAHs Tetrachloroethylene (PCE TPH-diesel TPH-gas TPH-MOTOR OIL 1,1,1-Trichloroethane (TCA Trichloroethylene (TCE Vinyl chloride Acetone Ethylbenzene Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene Toluene Xylenes
Confirmed COC:	* OTHER INORGANIC SOLID WASTE * Sludge - Paint * UNSPECIFIED ACID SOLUTION * UNSPECIFIED AQUEOUS SOLUTION * UNSPECIFIED OIL CONTAINING WASTE * UNSPECIFIED SOLVENT MIXTURES Benzene * OIL/WATER SEPARATION SLUDGE * DETERGENT & SOAP * ACID SOLUTION 2>PH WITH METALS * ALKALINE SOLUTION WITHOUT METALS Asbestos Containing Materials (ACM Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene Polynuclear aromatic hydrocarbons (PAHs Tetrachloroethylene (PCE TPH-diesel TPH-gas 1,1,1-Trichloroethane (TCA Trichloroethylene (TCE Vinyl chloride Acetone Ethylbenzene Toluene TPH-MOTOR OIL Xylenes
Potential Description:	AQUI, OTH, SOIL, SV, IA
Alias Name:	SACRAMENTO RAILYARD FACILITY
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC TRANSPORTATION CO
Alias Type:	Alternate Name

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Alias Name:	SP, SAC - CENTRAL SHOP
Alias Type:	Alternate Name
Alias Name:	SP-SAC - LOCOMOTIVE WORKS
Alias Type:	Alternate Name
Alias Name:	SP-SAC - OVERALL SITE
Alias Type:	Alternate Name
Alias Name:	Sac Railyard
Alias Type:	Alternate Name
Alias Name:	UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type:	Alternate Name
Alias Name:	00200100440000
Alias Type:	APN
Alias Name:	CAD073772030
Alias Type:	EPA Identification Number
Alias Name:	110000609770
Alias Type:	EPA (FRS #)
Alias Name:	110012532170
Alias Type:	EPA (FRS #)
Alias Name:	110033620295
Alias Type:	EPA (FRS #)
Alias Name:	T10000001832
Alias Type:	GeoTracker Global ID
Alias Name:	P11077
Alias Type:	PCode
Alias Name:	100139
Alias Type:	Project Code (Site Code)
Alias Name:	34320031
Alias Type:	Envirostor ID Number
Alias Name:	34360065
Alias Type:	Envirostor ID Number
Alias Name:	34400004
Alias Type:	Envirostor ID Number
Alias Name:	34400006
Alias Type:	Envirostor ID Number
Alias Name:	34400008
Alias Type:	Envirostor ID Number
Alias Name:	34400009
Alias Type:	Envirostor ID Number
Alias Name:	34400010
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Removal Action Workplan
Completed Date:	02/21/2003
Comments:	DTSC approved RAW for soil cleanup of six acres of the Central Shops Study area along a new rail line corridor prior to moving the frieght track. The RAW proposes excavation of soil impacted with SVOCs, VOCs and metals and implementation will be consistent with RDIP approved for soil remediation activities.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Design - Preliminary/Intermediate
Completed Date:	06/27/2014
Comments:	Not reported

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Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 07/03/2013
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Feasibility Study Report
Completed Date: 06/30/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 08/08/1995
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 05/12/1995
Comments: Offsite Groundwater RA Completed

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 04/27/1995
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 03/08/1993
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 02/28/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment Report
Completed Date: 02/09/1987
Comments: Site Screening is completed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Site Inspection (SI) Report
Completed Date: 08/27/1986
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan

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Completed Date: 05/11/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operations and Maintenance Report
Completed Date: 10/07/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operations and Maintenance Report
Completed Date: 10/07/2010
Comments: Not reported

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 06/01/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/31/2011
Comments: RWQCB shared draft letter with DTSC on 5/9/2011. DTSC GSU had no comments on 5/31/2011. RWQCB sent final letter to RP on 5/31/2011.

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 07/26/2011
Comments: Not reported

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 02/03/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 08/30/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 08/18/2011
Comments: Not reported

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Workplan
Completed Date: 01/19/2012
Comments: Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Well Installation Workplan
Completed Date: 03/12/2012
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 03/09/2012
Comments: Not reported

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 07/22/2013
Comments: Approved workplan except for dye, and with condition to work with NA tribe.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 05/07/2003
Comments: DTSC prepared a notice of determination (NOD) for Removal Action Workplan (RAW) for soil cleanup in six acres of the Central Shops Study Area of the Rail Yard. This plan would result in soil cleanup along a proposed new rail line corridor prior to moving the freight track. A comment period for the project was held from February 25 through March 27, 2003. A public meeting was held on March 11, 2003. Public comment were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Initial Study/ Environmental Impact Report
Completed Date: 04/27/1995
Comments: California Environmental Quality Act (CEQA) Ground Water Removal Action (GWRA) -- The DTSC has approved the final California CEQA package for vertical and horizontal containment of an off-site groundwater plume emanating from the SPTCo-Sacramento Rail Yard off-site to the south, the South Plume. The CEQA package project is implementation of two Interim Remedial Measures (IRMs), the South Plume Source Control and the South Plume Margin Control. The South Plume Margin Control consists of a groundwater extraction system located on P Street in Sacramento for leading edge capture. The South Plume Source Control consists of a groundwater/soil vapor extraction and treatment system located within the SPTCo-Sacramento Rail Yard to capture identified sources. Removal Action Work Plan (RAW) Groundwater Removal Action (GWRA) -- A Removal Action Workplan was approved for two South Plume Margin Control. The South Plume Margin Control consists of a groundwater extraction system located on P Street in Sacramento. The South Plume Source Control is comprised of a groundwater/soil vapor extraction and treatment system located within the Central Shops Study area of the SPTCo-Sacramento Rail Yard. The Interim Remedial Measures (IRMs) are being implemented to control the lateral and veritcal migration of groundwater contaminated with volatile organic compounds. The groundwater

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

extraction system became operational on May 12, 2001.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consent Order
Completed Date: 06/02/1988
Comments: Enforceable Agreement dated June 2, 1988

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 01/07/1980
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 03/20/2013
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment Report
Completed Date: 03/01/1984
Comments: Preliminary Assessment: Central Valley RWQCB (12/17/81) - operations are locomotive maintenance, engine building/ rebuilding, forging, metal painting, battery machining, wheel brake, & fabrication. In operation since 1863. 100-year flood plain.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 07/01/2005
Comments: DTSC approved the "Completion of Soil Remediation in 4.25 acre Main Freight Line Relocation within the Central Shops Area" on July 1, 2005. The RWQCB provided concurrence on July 8, 2005.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 12/01/2005
Comments: RP submitted inserts to the Draft HRA Report to update the conclusions to address DTSC's request for an indoor air evaluation. Conclusions were updated to indicate although no unacceptable risks are associated with the Central Shops and South Plume ground water under current conditions and land use, potential unacceptable risks may be associated with future land use, thus further evaluation with repect to soil and groundwater is required. This additional evaluation will be included in the Feasibility Study as part of the development of remedial goals for soil and groundwater. The future evaluation of VOCs will include all applicable exposure pathways including indoor air.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fact Sheets
Completed Date: 02/01/2003

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Notice
Completed Date: 02/01/2003
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Report
Completed Date: 10/01/2002
Comments: Final.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Implementation Workplan
Completed Date: 02/01/2003
Comments: Asbestos Contingency Plan

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 10/08/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Well Installation Workplan
Completed Date: 11/19/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Feasibility Study Workplan
Completed Date: 09/17/2008
Comments: Not reported

Completed Area Name: Sacramento County Garage
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 06/28/2011
Comments: RWQCB issued order and is overseeing necessary followup wtih the County Garage.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Implementation Workplan
Completed Date: 11/20/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Workplan
Completed Date: 04/19/2010
Comments: Not reported

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Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fact Sheets
Completed Date: 02/19/2013
Comments: Fact Sheet uploaded for the Central Shops and South Plume RAP

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Notice
Completed Date: 02/19/2013
Comments: Central Shops and South Plume RAP Public Notice.

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Workplan
Completed Date: 07/22/2013
Comments: Approval of workplan with exception of fluorescing dye tracer. Must coordinate with United Auburn Indian Community of the Auburn Rancheria per February 14, 2013 meeting.

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Design - Preliminary/Intermediate
Completed Date: 07/21/2014
Comments: Not reported

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Design - Preliminary/Intermediate
Completed Date: 01/13/2014
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 06/30/2014
Comments: Fieldwork completed. Several visits by Ruth, Cindy, Jerod, and RWQCB Brad.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Design - Preliminary/Intermediate
Completed Date: 01/13/2014
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Design - Preliminary/Intermediate
Completed Date: 01/13/2014
Comments: Not reported

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Work Notice
Completed Date: 05/09/2014
Comments: Work notice was finalized and distributed by UPRR/ERM to local businesses.

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Area Name:	South Plume (Groundwater)
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Design - Preliminary/Intermediate
Completed Date:	11/06/2014
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Design - Preliminary/Intermediate
Completed Date:	01/30/2015
Comments:	Workplan submitted 12/12/14. Comments issued 1/30/2015. Response to comments received 2/6/15 and considered adequate.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	CEQA - Responsible Agency Review
Completed Date:	07/03/2013
Comments:	See: 7/3/2013 "Remedial Action Plan (Central Shops - Soil and South Plume - GW)". Link: http://www.envirostor.dtsc.ca.gov/screens/menu.asp?global_id=34400004&table_name=COMPLIANCE_MANAGER&mycmd=viewdoc&doc_id=5005828
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	CEQA - Responsible Agency Review
Completed Date:	02/16/2000
Comments:	Notice of Determination
Future Area Name:	PROJECT WIDE
Future Sub Area Name:	Not reported
Future Document Type:	Remedial Action Completion Report
Future Due Date:	2017
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported
Facility ID:	60001378
Site Type:	State Response
Site Type Detail:	State Response or NPL
Acres:	31
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Site Code:	102074
Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	07
Senate:	06
Special Program Status:	Not reported
Status:	Active
Status Date:	12/01/2009
Restricted Use:	NO
Funding:	Responsible Party

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Latitude:	38.58585
Longitude:	-121.5016
APN:	NONE SPECIFIED
Past Use:	RAIL ROAD MAINTENANCE SHOP
Potential COC :	Asbestos Containing Materials (ACM Lead
Confirmed COC:	Lead Asbestos Containing Materials (ACM
Potential Description:	CSS, IA
Alias Name:	102074
Alias Type:	Project Code (Site Code)
Alias Name:	60001378
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Consent Order
Completed Date:	06/02/1988
Comments:	Enforceable Agreement dated June 2, 1988

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Report
Completed Date:	11/08/2010
Comments:	On November 8, 2010, DTSC confirmed the completion of lead and asbestos abatement activities within several historic buildings within the Central Shops at the Sacramento Railyards. The abatement work was done in coordination with historic preservation requirements and under contract terms with the California Pollution Control Financing Authority (CPCFA) for Prop 1C Brownfields grant money. CPCFA had requested DTSC, as lead agency, provide oversight and confirmation of completion of the activities anticipated by the grant award. The purpose of the abatement was to conduct environmental mitigation of hazardous materials to practical levels that accommodate rehabilitation of the buildings, including general construction activities or intrusive access and use. Remedial goals that were established for lead and asbestos were achieved.

Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

Facility ID:	60001447
Site Type:	State Response
Site Type Detail:	State Response or NPL
Acres:	17.46
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP, RWQCB 5R - Central Valley
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Site Code:	102140

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Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	07
Senate:	06
Special Program Status:	Not reported
Status:	No Further Action
Status Date:	03/17/2014
Restricted Use:	YES
Funding:	Responsible Party
Latitude:	38.58585
Longitude:	-121.5016
APN:	NONE SPECIFIED
Past Use:	RAIL ROAD MAINTENANCE SHOP, RAILROAD RIGHT OF WAY
Potential COC :	Asbestos Containing Materials (ACM Benzene Polynuclear aromatic hydrocarbons (PAHs TPH-diesel TPH-gas TPH-MOTOR OIL 1,1,1-Trichloroethane (TCA Trichloroethylene (TCE Vinyl chloride Acetone Ethylbenzene Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene Toluene Xylenes
Confirmed COC:	Benzene Polynuclear aromatic hydrocarbons (PAHs TPH-diesel TPH-gas 1,1,1-Trichloroethane (TCA Acetone Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Chrysene Fluoranthene Naphthalene Pyrene Ethylbenzene Toluene TPH-MOTOR OIL Xylenes Benz[a]anthracene Benzo[a]pyrene Dibenz[ah]anthracene Indeno[1,2,3-cd]pyrene Asbestos Containing Materials (ACM Trichloroethylene (TCE Fluorene Vinyl chloride
Potential Description:	OTH, SOIL, SV
Alias Name:	102140
Alias Type:	Project Code (Site Code)
Alias Name:	60001447
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Consent Order
Completed Date:	06/02/1988
Comments:	Enforceable Agreement dated June 2, 1988
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Correspondence
Completed Date:	11/30/2012
Comments:	DTSC sent letter via email to Stantec (City's consultant) regarding basin.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	*Correspondence - Received
Completed Date:	06/09/2011
Comments:	Transfer Notice of Property from Inland to City
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Technical Workplan
Completed Date:	07/27/2011

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Comments:	City Track Reloc Soil Management Plan
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Technical Report
Completed Date:	08/20/2011
Comments:	City Soil and Groundwater Monthly Report
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Technical Report
Completed Date:	06/25/2012
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Technical Report
Completed Date:	06/25/2012
Comments:	Not reported
Future Area Name:	PROJECT WIDE
Future Sub Area Name:	Not reported
Future Document Type:	Certification
Future Due Date:	2016
Future Area Name:	PROJECT WIDE
Future Sub Area Name:	Not reported
Future Document Type:	Land Use Restriction
Future Due Date:	2015
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported
Facility ID:	34400008
Site Type:	State Response
Site Type Detail:	State Response or NPL
Acres:	40
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP, RWQCB 5R - Central Valley
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Site Code:	100139
Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	07
Senate:	06
Special Program Status:	Not reported
Status:	Active
Status Date:	06/03/1992
Restricted Use:	YES
Funding:	Responsible Party
Latitude:	38.58950
Longitude:	-121.4968
APN:	002-0010-005, 002-0010-033, 002-0010-034, 00200100440000
Past Use:	RAIL ROAD MAINTENANCE SHOP

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Potential COC :	* HALOGENATED ORGANIC COMPOUNDS * OIL/WATER SEPARATION SLUDGE * OTHER ORGANIC SOLIDS * CONTAMINATED SOIL * UNSPECIFIED OIL CONTAINING WASTE * WASTE OIL & MIXED OIL Arsenic Benzene Lead Tetrachloroethylene (PCE TPH-diesel TPH-gas TPH-MOTOR OIL 1,1,1-Trichloroethane (TCA Trichloroethylene (TCE Vinyl chloride 1,4-Dioxane Ethylbenzene Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene Toluene Xylenes
Confirmed COC:	* UNSPECIFIED OIL CONTAINING WASTE * WASTE OIL & MIXED OIL Arsenic Benzene * HALOGENATED ORGANIC COMPOUNDS Lead * OIL/WATER SEPARATION SLUDGE * OTHER ORGANIC SOLIDS * CONTAMINATED SOIL Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene Tetrachloroethylene (PCE TPH-diesel TPH-gas 1,1,1-Trichloroethane (TCA Trichloroethylene (TCE Vinyl chloride 1,4-Dioxane Ethylbenzene Toluene TPH-MOTOR OIL Xylenes
Potential Description:	AQUI, SOIL
Alias Name:	SACRAMENTO RAILYARD FACILITY
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC TRANSPORTATION CO
Alias Type:	Alternate Name
Alias Name:	SP, SAC - LAGOON
Alias Type:	Alternate Name
Alias Name:	SP-SAC - LOCOMOTIVE WORKS
Alias Type:	Alternate Name
Alias Name:	SP-SAC - OVERALL SITE
Alias Type:	Alternate Name
Alias Name:	UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type:	Alternate Name
Alias Name:	UP, DOWNTOWN SAC - LAGOON
Alias Type:	Alternate Name
Alias Name:	002-0010-005
Alias Type:	APN
Alias Name:	002-0010-033
Alias Type:	APN
Alias Name:	002-0010-034
Alias Type:	APN
Alias Name:	00200100440000
Alias Type:	APN
Alias Name:	110000609770
Alias Type:	EPA (FRS #)
Alias Name:	110033620295
Alias Type:	EPA (FRS #)
Alias Name:	T10000001833
Alias Type:	GeoTracker Global ID
Alias Name:	T10000001982
Alias Type:	GeoTracker Global ID
Alias Name:	100139
Alias Type:	Project Code (Site Code)
Alias Name:	34400004
Alias Type:	Envirostor ID Number
Alias Name:	34400008

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Alias Type: Envirostor ID Number

Completed Info:

Completed Area Name: NW Corner
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Initial Study/ Neg. Declaration
Completed Date: 09/28/2006
Comments: Not reported

Completed Area Name: Soil
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 07/29/2004
Comments: DES/RDIP -- DESIGN/REMEDIAL DESIGN IMPLEMENTATION PLAN. THE LAGOON STUDY AREA (LSA) IS APPROXIMATELY 434 ACRES OF THE 240 ACRE FORMER SPTCO RAIL YARD LOCATED IN DOWNTOWN SACRAMENTO. THE LSA WAS UTILIZED FOR AS AN INDUSTRIAL WASTEWATER LAGOON, OIL/ WATER SEPERATOR OVERFLOW AREA, AND FORMER LOCATION OF A 50,000 GALLON OIL STORAGE TANK. THE RDIP 2004 PROVIDES FOR EXCAVATIONS, STORAGE, TREATMENT, AND OFFSITE DISPOSAL OF APPROXIMATELY 120,000 CUBIC YARDS OF SOIL CONTAMINATED VOLATILE ORGANIC COMPOUNDS SVOCs, AND TOTAL PETROLEUM HYDROCARBON (TPH) IN THE LAGOON STUDY AREA, AND CENTRAL CORRIDOR STUDY AREA, AND CAR SHOP NINE STUDY AREA FOR WHICH REMEDIAL ACTION PLANS (RAPs) HAVE BEEN PREVIOUSLY APPROVED.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 05/08/2003
Comments: RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safety clean up of asbestos if found during future soil excavation. In compliance with CEQA, DTSC has prepared a notice of exemption. A comment period for the project was held from February 25 through March 27, 2003. A public meeting was held on March 11, 2003. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: Soil
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 02/16/2000
Comments: Final Amended RAP approved for soil

Completed Area Name: Soil
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 05/22/2000
Comments: DES - The DTSC approved the Final Remediation Design and Implementation Report (RDIP) for Soil on May 22, 2000, for the Lagoon Study Area, 51 acres of the 240 acre SPTCo - Sacramento Rail Yard Site. The approved RDIP for remediation for the 239,640 cubic yards of contaminated soils consists of excavation, ex-situ vapor extraction, chemical stabilization and, off-site disposal. Imple-mentation of the RDIP is scheduled to begin in May of 2000, and to continue through October of 2005. The preliminary costs of the

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

remediation is estimated to be $17,115,480.

Completed Area Name: Soil
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 12/30/1998
Comments: RAP -- DTSC APPROVED THE FINAL RAP, DATED 12/28/98, APPROVED 12/30/98, FOR THE LSA 51 ACRES OF THE 240-ACRE SPTCO-SACRAMENTO RAILYARD SITE. THE APPROVED ALTERNATIVE FOR REMEDIATION FOR THE 239,640 CUBIC YARDS OF CONTAMINATED SOILS IDENTIFIED IN THE RAP IS EXCAVATION, EX-SITU VAPOR EXTRACTION, CHEMICAL STABILIZATION, ONSITE SECURE CONTAINMENT AND OFFSITE DISPOSAL. THE ONSITE DISPOSAL ALTERNATIVE INCLUDES DESIGN AND CONSTRUCTION OF AN ONSITE, 450,000 CUBIC YARD SOLD WASTE LANDFILL, PRIMARILY DESIGNED FOR RELATIVELY INERT METALS CONTAMINATED SOILS. THE LANDFILL WILL BE DESIGNED AND CONSTRUCTED AS A CLASS II LANDFILL. THE ONSITE LANDFILL HAS BEEN APPROVED WITH THE FOLLOWING REQUIREMENTS: NO LIQUIDS MAY BE DISPOSED ONSITE, ALL METAL CONTAMINATED SOILS WITH ORGANICS MAY ONLY BE PLACED IN THE LANDFILL IF THE ORGANIC CONSTITUENTS ARE ALL LESS THAN THRESHOLD VALUES, NO RCRA WASTES, AND NO CALIFORNIA HAZARDOUS WASTE THAT HAS NOT BEEN CLASSIFIED AS DESIGNATED WASTE. IMPLEMENTATION OF THE SELECTED ALTERNATIVE IS SCHEDULED TO BEGIN IN APRIL OF 2000 AND TO CONTINU THROUGH OCTOBER OF 2005. THE PRELIMINARY COST OF THE PROPOSED ALTERNATIVE IS EXTIMATED TO BE $20,315,000.

Completed Area Name: Soil
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 11/25/1997
Comments: RIFS -- Soil FS approved. LSA represents 51 acres of the 240 acre SPTCo- Sacramento Rail Yard. The approved RIFS has initially identified 51,965 cubic yards of contaminated soils that will require offsite disposal and 187,675 cubic yards of contaminated soils that will be disposed of onsite. The onsite disposal alternative includes design and construction of an onsite 450,000 cubic yard solid waste landfill, primarily designed for relatively intert metals contaminated soils. The landfill will be designed and constucted as a Class II landfill. The onsite landfill has been approved with the following requirements: no liquids may be disposed of onsite, all metal contaminated soils with organics may only be placed in the landfill if the organic constituents are all less than threshold values, no RCRA waste, and no California Hazardous Waste that has not been classified as designated waste. The preliminary cost of the proposed alternative, Alternative H, is $20,315,000. The final RAP is scheduled for completion in September 1998.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 04/27/1995
Comments: RA (LSARA) -- The Interim Remedial Measure (IRM) is being implemented for remediation of soil contaminated with Volatile Organic Compounds (VOC's), Semi-Volatile Organic Compounds (SVOC's), and metals from operation and maintenance activities at the SPTCo-Sacramento Rail Yard. The IRM consists of excavation remediation of approximately 2500 cubic yards of contaminated soils from the Industrial Waste Water Lagoon. The contaminated soil will be stockpiled and treated at

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

the Drum Storage Area (DSA utilizing the existing DSA soil vapor extraction and treatme system to remediate VOC contamination. The VOC remediated soils will then be chemically stabilized/solidified to treat SVOC and metal contamination. The remediated/stabilized soil will then be disposed of at the ECDC Utah Landfill.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 10/06/1993
Comments: Not reported

Completed Area Name: NW Corner
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan w/ESD
Completed Date: 09/13/2006
Comments: Not reported

Completed Area Name: NW Corner
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan Amendment
Completed Date: 02/21/2003
Comments: RAP/NWLSA--DTSC approved a RAP amendment for soil cleanup of an 11 acre portion of the Lagoon Study Area (LSA) of the railyard site. The Amendment to the 2000 Final Amended Industrial Wastewater Lagoon Remedial Action Plan for Soil changes the remedy for the northwestern corner of the LSA from excavation and offsite disposal to grading and capping with an engineered paved cover. Land use will be limited under a deed restriction. In compliance with CEQA, DTSC has prepared a Notice of Determination (NOD) for this project. A comment period for the project was held from February 25 through March 27, 2003. A public meeting was held on March 11, 2003. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: NW Corner
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 06/06/2007
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Implementation Workplan
Completed Date: 02/01/2003
Comments: Asbestos Contingency Plan

Completed Area Name: NW Corner
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Implementation Workplan
Completed Date: 03/28/2007
Comments: Implementation Plan Approved

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 01/05/2008
Comments: dddd

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 02/22/2010
Comments: Not reported

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 09/17/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 06/30/2010
Comments: Not reported

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 04/26/2011
Comments: Sent email approval on 2/15/2011 for well abandoment, and on 4/26/2011 for well replacement locations.

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 10/03/2011
Comments: Not reported

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 02/01/2012
Comments: Not reported

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 10/17/2014
Comments: Not reported

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 01/30/2015
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 05/07/2003
Comments: CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine, and Northern Shops RAP for Soil. The

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

ACP establishes the process to identify the presence of and safely clean up asbestos if found during future soil excavation. A comment period for the project was held from 2/25/03 to 3/27/03. A public meeting was held on 3/11/03. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: NW Corner
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 05/07/2003
Comments: CEQA/NOD--An NOD was approved for actions selected under a Remedial Action Plan Amendment prepared for soil remediation of an 11 acre Northwestern portion of the Lagoon Study Area. DTSC prepared an Initial Study Agency Checklist which relies on the City of Sacramento EIRs prepared for redevelopment projects which includes the Railyard. The NOD and supporting evaluations were made available for public review for 30 days from 2/25/03 to 3/27/03 and was presented at the 3/11/03 public meeting held at the Sacramento Amtrak Depot. A notice was displayed in the Sacramento Bee newspaper and a fact sheet was mailed to the site mailing list to provide information and announce the review period and a public meeting.

Completed Area Name: 7th Street Corridor
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 07/11/2001
Comments: The 7th Street Corridor deed restriction prohibits land uses including residental, hospital, public or private schools for persons uncer 18 years of age, day care centers, raising of food, drilling for water, and extraction of groundwater. No activities are allowed that will disturb the soil without a soils management plan and health and safety plan and contaminated soils brought to the surface shall be managed in accordance with all applicable state and federal laws. The deed restriction also allows access for the Department for monitoring, inspection, and other activities.

Completed Area Name: Soil
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 02/16/2000
Comments: CEQA/NOD - The DTSC approved the Notice of Determination for the LSA Final Amended (FARAP) for Soil, and the NSSA, CSNSA, and CCSA Final Remedial Action Plan (FRAP) for Soil.

Completed Area Name: Soil
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 12/30/1998
Comments: CEQA - The DTSC issued the Notice of Determination for the Lagoon Study Area Final RAP, approved remedial alternative on December 30, 1999.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consent Order
Completed Date: 06/02/1988
Comments: Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Future Area Name:	Soil
Future Sub Area Name:	Not reported
Future Document Type:	Certification
Future Due Date:	2015
Future Area Name:	Groundwater
Future Sub Area Name:	Not reported
Future Document Type:	Land Use Restriction
Future Due Date:	2018
Future Area Name:	Groundwater
Future Sub Area Name:	Not reported
Future Document Type:	Certification
Future Due Date:	2018
Future Area Name:	NW Corner
Future Sub Area Name:	Not reported
Future Document Type:	Remedial Action Completion Report
Future Due Date:	2016
Future Area Name:	Groundwater
Future Sub Area Name:	Not reported
Future Document Type:	Design/Implementation Workplan
Future Due Date:	2017
Future Area Name:	Groundwater
Future Sub Area Name:	Not reported
Future Document Type:	Remedial Action Plan
Future Due Date:	2016
Future Area Name:	NW Corner
Future Sub Area Name:	Not reported
Future Document Type:	Operations and Maintenance Plan
Future Due Date:	2017
Future Area Name:	Groundwater
Future Sub Area Name:	Not reported
Future Document Type:	Feasibility Study Report
Future Due Date:	2016
Future Area Name:	NW Corner
Future Sub Area Name:	Not reported
Future Document Type:	Design/Implementation Workplan
Future Due Date:	2015
Future Area Name:	Soil
Future Sub Area Name:	Not reported
Future Document Type:	5 Year Review Reports
Future Due Date:	2020
Schedule Area Name:	Soil
Schedule Sub Area Name:	Not reported
Schedule Document Type:	5 Year Review Reports
Schedule Due Date:	06/30/2015
Schedule Revised Date:	Not reported
Schedule Area Name:	Soil
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Land Use Restriction
Schedule Due Date:	06/30/2015
Schedule Revised Date:	Not reported

Facility ID:	34400009
Site Type:	State Response
Site Type Detail:	State Response or NPL
Acres:	40
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP, RWQCB 5R - Central Valley

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Site Code:	100139
Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	07
Senate:	06
Special Program Status:	Not reported
Status:	Active
Status Date:	06/03/1992
Restricted Use:	YES
Funding:	Responsible Party
Latitude:	38.58946
Longitude:	-121.4996
APN:	002-0010-005, 002-0010-033, 002-0010-034, 00200100440000
Past Use:	RAIL ROAD MAINTENANCE SHOP
Potential COC :	* HALOGENATED ORGANIC COMPOUNDS * CONTAMINATED SOIL * UNSPECIFIED OIL CONTAINING WASTE Lead
Confirmed COC:	NONE SPECIFIED
Potential Description:	SOIL
Alias Name:	SACRAMENTO RAILYARD FACILITY
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC TRANSPORTATION COMPANY
Alias Type:	Alternate Name
Alias Name:	SP, SAC - CAR SHOP NINE
Alias Type:	Alternate Name
Alias Name:	SP-SAC - LOCOMOTIVE WORKS
Alias Type:	Alternate Name
Alias Name:	SP-SAC - OVERALL SITE
Alias Type:	Alternate Name
Alias Name:	UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type:	Alternate Name
Alias Name:	002-0010-005
Alias Type:	APN
Alias Name:	002-0010-033
Alias Type:	APN
Alias Name:	002-0010-034
Alias Type:	APN
Alias Name:	00200100440000
Alias Type:	APN
Alias Name:	110000609770
Alias Type:	EPA (FRS #)
Alias Name:	110033620295
Alias Type:	EPA (FRS #)
Alias Name:	T10000001834
Alias Type:	GeoTracker Global ID
Alias Name:	100139
Alias Type:	Project Code (Site Code)
Alias Name:	34400004
Alias Type:	Envirostor ID Number
Alias Name:	34400009
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Design/Implementation Workplan

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Date: 07/29/2004
Comments: DES/RDIP -- DESIGN/REMEDIAL DESIGN IMPLEMENTATION PLAN. THE CAR SHOP NINE STUDY AREA (CSNSA) IS APPROXIMATELY 44 ACRES OF THE 240 ACRE FORMER SPTCO RAIL YARD LOCATED IN DOWNTOWN SACRAMENTO. THE CSNSA WAS UTILIZED FOR CONSTRUCTING AND PAINTING RAIL CARS; SANDBLASTING; GENERAL OFFICES; AND RAIL YARD OPERATIONS. THE RDIP 2004 PROVIDES FOR EXCAVATIONS, STORAGE, TREATMENT, AND OFFSITE DISPOSAL OF APPROXIMATELY 120,000 CUBIC YARDS OF SOIL CONTAMINATED VOLATILE ORGANIC COMPOUNDS (VOCs), SVOC, AND TOTAL PETROLEUM HYDROCARBON (TPH) IN THE CAR SHOP NINE STUDY AREA, LAGOON STUDY AREA, AND CENTRAL CORRIDOR STUDY AREA FOR WHICH REMEDIAL ACTION PLANS (RAPs) HAVE BEEN PREVIOUSLY APPROVED.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 05/08/2003
Comments: RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safety clean up of asbestos if found during future soil excavation.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 01/30/2009
Comments: Soil remedial action met the cleanup levels.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 05/22/2000
Comments: DES - The DTSC approved the Final Remediation Design and Implementation Report (RDIP) on May 22, 2000, for the Car Shop Nine Study Area, 40 acres of the 240 acre SPTCo - Sacramento Rail Yard Site. The approved RDIP is for the 132,718 cubic yards of contaminated soils consists of excavation, land farming, chemical stabilization and, off-site disposal. Implementation of the RDIP is scheduled to begin in May of 2000, and to continue through October of 2005. The preliminary costs of the proposed alternative is estimated to be 8,050,957.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 02/16/2000
Comments: RAP - The DTSC approved the Final RAP, for the Car Shop Nine Study Area, which consists of 40 acres of the 240 acre SPTCo- Sacramento Rail Yard site. The approved alternative for approved alternative for remediation for the 132,718 cubic yards of contaminated soils identified in the RAP is excavation, land farming, chemical stabilization and off-site disposal. Implementation of selected alternative is scheduled to being in May of 2000 and to continue through October of 2005. The preliminary cost of the proposed alternative is estimated to be $8,050,957. CEQA/NOD -

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	CEQA - Notice of Exemption
Completed Date:	02/20/2003
Comments:	CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine, and Northern Shops RAP for Soil. A comment period for the project was held from February 25 through March 27, 2003. A public meeting was held on March 11, 2003. Public comments were received by DTSC and addressed through a responsiveness summary. The ACP establishes the process to identify the presence of and safely clean up asbestos if found during future soil excavation. A comment period for the project was held from 2/25/03 to 3/27/03. A public meeting was held on 3/11/03. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Land Use Restriction
Completed Date:	07/11/2001
Comments:	The 7th Street Corridor deed restriction prohibits land uses including residental, hospital, public or private schools for persons uncer 18 years of age, day care centers, raising of food, drilling for water, and extraction of groundwater. No activities are allowed that will disturb the soil without a soils management plan and health and safety plan and contaminated soils brought to the surface shall be managed in accordance with all applicable state and federal laws. The deed restriction also allows access for the Department for monitoring, inspection, and other activities.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	CEQA - Initial Study/ Environmental Impact Report
Completed Date:	02/16/2000
Comments:	CEQA/NOD - The DTSC approved the Notice of Determination for the LSA Final Amended (FARAP), and the NSSA, CSNSA, and CCSA Final Remedial Action Plan (FRAP).

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Investigation / Feasibility Study
Completed Date:	10/05/1998
Comments:	RI/FS -- The Union Pacific Railroad Company has completed soil characterization of the former Southern Pacific Transportation Company - Sacramento Railyard Car Shop Nine Study Area (CSNSA). Groundwater contamination for the CSNSA will be addressed within the Lagoon Groundwater and Central Shops South Plume RI/FS and RAP. The CSNSA was utilized for constructing rail cars, painting rail cars, sandblasting, general offices and railyard operations buildings. Additionally, five Underground Storage Tanks were located at the CSNSA. During Phase I characterization, soil gas samples were collected from 11 locations, 31 soil borings were drilled and sampled, andgroundwater samples were collected from 24 locations. During Phase II, the final Phase 25 additional soil borings were drilled. Compounds of concern (COC'S) detected in the soil included VOC'S-VC and TCE, SVOC'S-PNA'S, Anthracene and Chrysene, TPH-#2 and

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

#6 fuel oil, oil and grease and extractable and metals-arsenic, Lead, Cadmium, and beryllium. The lateral and vertical extent of COC'S detected in the soil has been sufficiently defined for purposes of developing the soil, final remedial action objectives.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 10/26/2008
Comments: Filedwork was completed in accordance with project documents.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 06/30/2010
Comments: Not reported

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Certification
Future Due Date: 2015
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: 5 Year Review Reports
Future Due Date: 2020
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: 5 Year Review Reports
Schedule Due Date: 06/30/2015
Schedule Revised Date: Not reported
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: Land Use Restriction
Schedule Due Date: 06/30/2015
Schedule Revised Date: Not reported

Facility ID: 34400010
Site Type: State Response
Site Type Detail: State Response or NPL
Acres: 40
National Priorities List: NO
Cleanup Oversight Agencies: SMBRP, RWQCB 5R - Central Valley
Lead Agency Description: DTSC - Site Cleanup Program
Project Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Site Code: 100139
Site Mgmt. Req.: NONE SPECIFIED
Assembly: 07
Senate: 06
Special Program Status: Not reported
Status: Active
Status Date: 06/03/1992
Restricted Use: NO
Funding: Responsible Party
Latitude: 38.58557
Longitude: -121.5016

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

APN:	NONE SPECIFIED
Past Use:	RAIL ROAD MAINTENANCE SHOP
Potential COC :	* HALOGENATED ORGANIC COMPOUNDS Lead
Confirmed COC:	* HALOGENATED ORGANIC COMPOUNDS Lead
Potential Description:	SOIL
Alias Name:	SACRAMENTO RAILYARD FACILITY
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC TRANSPORTATION CO
Alias Type:	Alternate Name
Alias Name:	SP, SAC - CENTRAL CORRIDOR
Alias Type:	Alternate Name
Alias Name:	SP-SAC LOCOMOTIVE WORKS
Alias Type:	Alternate Name
Alias Name:	SP-SAC OVERALL SITE
Alias Type:	Alternate Name
Alias Name:	UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type:	Alternate Name
Alias Name:	CAD073772030
Alias Type:	EPA Identification Number
Alias Name:	110000609770
Alias Type:	EPA (FRS #)
Alias Name:	110012532170
Alias Type:	EPA (FRS #)
Alias Name:	110033620295
Alias Type:	EPA (FRS #)
Alias Name:	T10000001962
Alias Type:	GeoTracker Global ID
Alias Name:	100139
Alias Type:	Project Code (Site Code)
Alias Name:	34400004
Alias Type:	Envirostor ID Number
Alias Name:	34400010
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	CEQA - Notice of Exemption
Completed Date:	02/20/2003
Comments:	CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine, and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safely clean up asbestos if found during future soil excavation. A comment period for the project was held from 2/25/03 to 3/27/03. A public meeting was held on 3/11/03. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	CEQA - Responsible Agency Review
Completed Date:	04/17/2002
Comments:	CEQA - NOD -- The Department approved an Explanation of Significant Differences (ESD) on 4/17/02 to permit soil bioremediation treatment on-site. To meet the requirements of the California Environmental Quality Act, DTSC, in its role as the Lead Agency for the soil remediation of the site, has considered the Environmental Impact

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Reports prepared for and certified by the City of Sacramento (City). DTSC has determined that the EIRs and supporting documents relied on for approval of the site soil Remedial Action Plans have adequately adddressed the potential impacts of the project proposed under the ESD. DTSC, using its independent judgement has determined that the project, in its approved form, will not result in a significant adverse effect on the environment. A Notice of Determination indicating the results of said findings has been filed with the State Clearninghouse of the Governor's Office of Planning and Research pursuant to Section 15096(i) of the State CEQA Guidelines.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 02/16/2000
Comments: CEQA/NOD - The DTSC approved the Notice of Determination for the LSA Final Amended RAP(FARAP), and the NSSA, CSNSA, and CCSA Final Remedial Action Plan (FRAP) on February 16, 2000.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 07/29/2004
Comments: DES/RDIP -- DESIGN/REMEDIAL DESIGN IMPLEMENTATION PLAN. THE CAR SHOP NINE STUDY AREA (CSSA) IS APPROXIMATELY 35 ACRES OF THE 240 ACRE FORMER SPTCO RAIL YARD LOCATED IN DOWNTOWN SACRAMENTO. THE CSSA WAS UTILIZED FOR BOXCAR CLEANING DISMANTLING AND SANDBLASTING. A SAWMILL WAS UTILIZED FOR LUMBER MILLING, PLAINING, AND WOODWORKING. THE RDIP 2004 PROVIDES FOR EXCAVATION, STORAGE, TREATMENT, AND OFFSITE DISPOSAL OF APPROXIMATELY 120,000 CUBIC YARDS OF SOIL CONTAMINATED WITH VOLATILE ORGANIC COMPOUNDS (VOCs), SVOC, AND TOTAL PETROLEUM HYDROCARBON (TPH) IN THE CENTRAL CORRIDOR STUDY AREA, CAR SHOP NINE STUDY AREA, AND LAGOON STUDY AREA FOR WHICH REMEDIAL ACTION PLANS (RAPs) HAVE BEEN PREVIOUSLY APPROVED.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 05/08/2003
Comments: RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safety clean up of asbestos if found during future soil excavation. In compliance with CEQA, DTSC has prepared a notice of exemption. A comment period for the project was held from February 25 through March 27, 2003. A public meeting was held on March 11, 2003. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 04/17/2002
Comments: RAP - ESD -- The Department has approved an Explanation of Significant Differences (ESD) on 4/17/02 to permit soil bioremediation treatment on-site. Soil remediation strategies

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

approved under the site Remedial Action Plans (RAP) includes excavation of impacted soil, treating certain soil prior to reuse or disposal, and loading all waste soil for off-site disposal to a landfill. Treatment options approved under the RAP did not specifically include bioremediation of soil. The enclosed ESD has been prepared to amend the site RAP administrative record to include bioremediation treatment of stockpiled soil containing petroleum hydrocarbon. The proposed change is protective of human health and the environment, complies with appropriate, applicable or relevant federal and state requirements and remains cost-effective.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 01/30/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 05/22/2000
Comments: DES - The DTSC approved the Final Remediation Design and Implementation Report (RDIP) on May 22, 2000, for the Central Corridor Study Area, 29 acres of the 240 acre SPTCo - Sacramento Rail Yard Site. The approved RDIP for remediation for the 98,888 cubic yards of contaminated soils consists of excavation, land farming, chemical stabilization and, off-site disposal. Implementation of the RDIP is scheduled to begin in May of 2000, and to continue through October of 2005. The preliminary costs of the proposed alternative is estimated to be 5,998,757.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 02/16/2000
Comments: RAP - The DTSC approved the Final RAP for the Central Corridor Study Area which consists of 29 acres of the 240 acre Southern Pacific Transportation- Sacramento Rail Yard Site. The approved alternative for remediation for the 98,888 cubic yards of contaminated soils identified in the RAP is excavation, land farming, chemical stabilization and off-site disposal. Implementation of the selected alternative is scheduled to begin in May of 2000 and to continue through October of 2005. The preliminary cost of proposed alternative is estimated to be $5,998,757.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 10/05/1998
Comments: RI/FS - The Union Pacific Railroad Company has completed soil characterization of the former Southern Pacific Transportation Company - Sacramento Railyard, Central Corridor Study Area (CCSA). Groundwater contamination for the CCSA will be addressed within the Lagoon groundwater and Central Shops/South Plume Remedial Investigation/Feasibility Study (RI/FS) and Remedial Action Plan (RAP). The CCSA was utilized for boxcar cleaning and dismantiling, sandblasting, general offices, and a sawmill. Additionally, four

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

underground storage tanks (USTs) were located at the CCSA. During Phase 1 Characterization, soil gas samples were collected from 69 locations, 22 soil borings were drilled and sampled, and groundwater samples were collected from 12 locations. During Phase II, the final phase, 19 additional soil borings were drilled. Compunds of concern (COC's) detected in the soil included volatile organic compounds (VOCs) - vinyl chloride (VC) and Trichloroethylene (TCE), Semi-volatile organic compounds (SVOCs)- Polynuclear Aromatics (PNAs), anthracene and chrysene, Total petroleum hydrocarbons TPH-#2 and #6 fuel oil, oi and grease and extractable, and metal-arsenic, lead, cadmium, and beryllium. The lateral and vertical extent of COCs detected in the soil has been sufficiently defined for purposes of developing the soil, final remedial action objectives.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 10/26/2008
Comments: Fielwork was performed in accordance with project documents.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 06/30/2010
Comments: Not reported

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Certification
Future Due Date: 2015
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: 5 Year Review Reports
Schedule Due Date: 06/30/2015
Schedule Revised Date: Not reported
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: Land Use Restriction
Schedule Due Date: 06/30/2015
Schedule Revised Date: Not reported

Facility ID: 34320031
Site Type: State Response
Site Type Detail: State Response or NPL
Acres: Not reported
National Priorities List: NO
Cleanup Oversight Agencies: HWMP, SMBRP, RWQCB 5R - Central Valley
Lead Agency Description: Not reported
Project Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Site Code: 100139
Site Mgmt. Req.: NONE SPECIFIED
Assembly: 07
Senate: 06
Special Program Status: Not reported
Status: Certified

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Status Date:	06/22/1990
Restricted Use:	NO
Funding:	Responsible Party
Latitude:	38.58553
Longitude:	-121.5018
APN:	00200100440000
Past Use:	RAIL ROAD MAINTENANCE SHOP, SAND BLASTING
Potential COC :	Lead
Confirmed COC:	Lead
Potential Description:	SOIL
Alias Name:	SOUTHERN PACIFIC TRANSPORTATION CO
Alias Type:	Alternate Name
Alias Name:	SP, SAC - SAND PILES
Alias Type:	Alternate Name
Alias Name:	00200100440000
Alias Type:	APN
Alias Name:	110000609770
Alias Type:	EPA (FRS #)
Alias Name:	110033620295
Alias Type:	EPA (FRS #)
Alias Name:	T10000001980
Alias Type:	GeoTracker Global ID
Alias Name:	100139
Alias Type:	Project Code (Site Code)
Alias Name:	34320031
Alias Type:	Envirostor ID Number
Alias Name:	34400004
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Action Completion Report
Completed Date:	11/24/1989
Comments:	Remedial action completed. The material was segregated. The majority was recycled in the production of asphalt. Some material was disposed of at a Class I landfill. Concrete, wood, and metal debris were taken to a Class III landfill. 2,341 tons were recycled, 1,169 tons were removed.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Certification
Completed Date:	06/22/1990
Comments:	Certified. DHS cleanup goal of 950 mg of lead/kg of soil was met.

Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

Facility ID:	60001957
Site Type:	State Response

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Site Type Detail:	State Response or NPL
Acres:	240
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Site Code:	100139
Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	07
Senate:	06
Special Program Status:	Not reported
Status:	Active
Status Date:	01/08/2014
Restricted Use:	NO
Funding:	Responsible Party
Latitude:	38.58422
Longitude:	-121.5003
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC :	NONE SPECIFIED
Confirmed COC:	NONE SPECIFIED
Potential Description:	NONE SPECIFIED
Alias Name:	100139
Alias Type:	Project Code (Site Code)
Alias Name:	60001957
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	AB 2061 - Designation
Completed Date:	03/29/2007
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported
Facility ID:	34400005
Site Type:	State Response
Site Type Detail:	State Response or NPL
Acres:	2
National Priorities List:	NO
Cleanup Oversight Agencies:	HWMP, SMBRP, RWQCB 5R - Central Valley
Lead Agency Description:	Not reported
Project Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Site Code:	100139
Site Mgmt. Req.:	NONE SPECIFIED

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Assembly:	07
Senate:	06
Special Program Status:	* RCRA 3012 - Past Haz Waste Disp Inven Site
Status:	Certified / Operation & Maintenance
Status Date:	01/12/1996
Restricted Use:	YES
Funding:	Responsible Party
Latitude:	38.58849
Longitude:	-121.4994
APN:	NONE SPECIFIED
Past Use:	RAIL ROAD MAINTENANCE SHOP, WASTE WATER PONDS
Potential COC :	* HALOGENATED ORGANIC COMPOUNDS * OIL/WATER SEPARATION SLUDGE * CONTAMINATED SOIL * UNSPECIFIED OIL CONTAINING WASTE * WASTE OIL & MIXED OIL Arsenic Benzene Lead Tetrachloroethylene (PCE TPH-diesel TPH-gas TPH-MOTOR OIL Trichloroethylene (TCE Acetone Dibromochloromethane 1,2-Dibromo-3-chloropropane (DBCP 1,1-Dichloroethane 1,2-Dichloroethane (EDC 1,1-Dichloroethylene 1,2-Dichloroethylene (cis 1,2-Dichloroethylene (trans 4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB) 2,4-Dichlorophenoxyacetic Acid (2,4-D 1,2-Dichloropropane 1,3-Dichloropropane 1,3-Dichloropropene 2,3-Dichloropropanol Ethyl acrylate Polynuclear aromatic hydrocarbons (PAHs 1,1,1,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane Toluene 1,2,4-Trichlorobenzene 1,1,2-Trichloroethane Xylenes
Confirmed COC:	10196-NO 10199-NO 30001-NO 30003-NO 10002-NO 30013-NO 10060-NO 10097-NO 30472-NO 30535-NO 30536-NO 30563-NO 30564-NO 30022-NO 30024-NO 30025-NO 30027-NO 30032-NO 30180-NO 30181-NO 30192-NO 30193-NO 30194-NO 30195-NO 30196-NO 30198-NO 30199-NO 30200-NO 30201-NO 30202-NO 30203-NO 30271-NO 30550-NO 3002502-NO 30593-NO
Potential Description:	AQUI, SOIL
Alias Name:	SACRAMENTO RAILYARD FACILITY
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC TRANSPORTATION CO
Alias Type:	Alternate Name
Alias Name:	SP, SAC - PONDS AND DITCH
Alias Type:	Alternate Name
Alias Name:	SP-SAC - LOCOMOTIVE WORKS
Alias Type:	Alternate Name
Alias Name:	SP-SAC - OVERALL SITE
Alias Type:	Alternate Name
Alias Name:	SP-SAC - PONDS AND DITCH
Alias Type:	Alternate Name
Alias Name:	UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type:	Alternate Name
Alias Name:	CAD073772030
Alias Type:	EPA Identification Number
Alias Name:	110000609770
Alias Type:	EPA (FRS #)
Alias Name:	110012532170
Alias Type:	EPA (FRS #)
Alias Name:	110033620295
Alias Type:	EPA (FRS #)
Alias Name:	T10000001977
Alias Type:	GeoTracker Global ID
Alias Name:	P14029

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Alias Type: PCode
Alias Name: 100139
Alias Type: Project Code (Site Code)
Alias Name: 34400004
Alias Type: Envirostor ID Number
Alias Name: 34400005
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/19/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/29/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 04/28/1995
Comments: RMDL (GW2) -- The Ponds and Ditch Study Area (PDSA) groundwater extraction system has been modified and implemented to meet the requirements of the Remedial Action Plan and Closure Plan (RAP) for the Southern Pacific Transportation Company-Sacramento, Rail Yard PDSA. The original five well extraction system selected as the remedial alternative was modified to be a seven well extraction and treatment system after total Volatile Organic Compound (VOC) discharge levels exceeded the 100 parts per billion (ppb) total VOC level required for extraction and discharge into the Sacramento City sewer system. An original groundwater extraction well, exw-4, was identified as the primary source of VOC's. To address this, SPTCo installed two additional groundwater extraction wells, exw-6 and exw-7, and connected exw-4, exw-6 and exw-7 to the existing Drum Storage Area soil vapor/groundwater extraction system for treatment prior to discharge. The original PDSA groundwater extraction system was in operation on November 5, 1992. The complete, modified groundwater extraction system has been in operation since Aug. 15, 1994.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operations and Maintenance Plan
Completed Date: 06/30/1994
Comments: ORDER -- the Department, after extensive efforts to negotiate an agreement with SPTCo, issued an Order to SPTCo for Operation and Maintenance of a groundwater extraction system at the Pond and Ditch site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 06/23/1994
Comments: DESIGN -- the Department approved SPTCo's Modified Pond & Ditch

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Extraction system: Final Design Report. The Final Design Report provides detailed plumbing and electrical plans and provides discharge requirements from the City of Sacramento and treatment requirements from the County of Sacramento.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Report
Completed Date: 01/05/1994
Comments: RI/FS -- FOURTEEN GROUND WATER SAMPLES WERE COLLECTED DOWN GRADIENT, AT THE ESTIMATED MARGIN OF THE UPPER SAND ZONE GROUNDWATER PLUME. RESULTS FROM THE SAMPLING INDICATE THAT THE PLUME MARGIN IS WITHIN THE ESTIMATED MARGIN, COMPLETING CHARACTERIZATION AND ALLOWING TREATMENT BY THE EXISTING, MODIFIED GROUND WATER EXTRACTION SYSTEM. APPROX. COST OF THIS SAMPLING WAS $50,000 WHICH WAS PAID FOR BY THE RP.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 05/30/1993
Comments: FRA (SOIL) -- This final remedial action consisted of back- filling and compaction of an excavation with 11,000 cubic yards of imported clean fill and was completed May 30, 1993. In order to meet the RCRA Closure requirements for this unit, prior to backfilling an area of excavation, a post- remediation health risk assessment was required. The recently approved assessment has shown the site will not pose unacceptable risks, therefore allowing backfill of the excavation. Approx cost = $110,000 (RP funded)

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedy Constructed: Operating Properly & Successfully
Completed Date: 10/29/1992
Comments: FRA (GW1) -- A 5-well ground water extraction system was started up at the site. The system initially withdrew 250 gpm of water impacted by chlorinated solvents. The system evaluation conducted since the start-up has shown that augmentation will be required with at least two additional extraction wells and predischarge treatment to reduce contaminant concentrations to levels acceptable for discharge to the city of Sacramento sewer system for treatment at the publicly owned treatment works. Approx. 110,000,000 gallons pumped & treated this FY. Approx. cost = $250,000 (RP funded)

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 06/27/1991
Comments: OIL POND REMOVAL

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 06/20/1991
Comments: APPROXIMATELY 1880 CUBIC YARDS OF SOIL WAS EXCAVATED AND DISPOSED

Completed Area Name: PROJECT WIDE

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 03/30/1990
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 06/30/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 02/28/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 12/31/1987
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 07/31/1985
Comments: Removal Action: Pond - soil/sludge removal.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/09/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 05/07/2003
Comments: CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine, and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safely clean up asbestos if found during future soil excavation. A comment period for the project was held from 2/25/03 to 3/27/03. A public meeting was held on 3/11/03. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 01/12/1996
Comments: Wastewater disposal pond/ditch. Contaminants include Pb, toluene, TCE, PCE, 1,1-DCA, xylene, benzene, 1,1,1-TCA, and PAH. Groundwater contaminated with Ni, TCE, Cr, 1,2-DCE, and methylene chloride.

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 05/19/1994
Comments: The deed restriction indicates that the property can be used without restriction for: 1) industrial and commercial and 2) the landscaped and paved areas ancillary to the industrial, commercial or office structures that are covered with 2 feet of clean soil, if not used for play areas. Restricted uses include 1) excavation for any purpose other than remediation 2) residential, 3) public or institutional uses 4) educational 5) day care 6) parks, playgrounds water features, open space, yards, gardens and landscaped areas. Soil must be managed as approved by the Department and infrastructure improvements must be developed consistent with the Deed restriction. In the industrial or commercial use areas, where exposure to soils is possible, such as landscaped area or easements, the owner shall continually keep and maintain clean soil to such depth as the owner or occupant has demonstrated to the reasonable satisfaction of the Department to be protective of human health and the environment. If additional contamination is found during development, adequate measures must be taken to achieve permanent remediation and prevent unacceptable exposure to humans or the environment. The soil disposal shall be managed in accordance with all applicable state and federal laws. No water from below the surface shall be extracted or utilized in any way or consumed, although access will be allowed for groundwater monitoring and extraction systems for Union Pacific, it successors or agents, and the Department for monitoring, inspection, and other activities.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 07/28/1987
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 04/19/1984
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 05/07/2003
Comments: RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safety clean up of asbestos if found during future soil excavation. In compliance with CEQA, DTSC has prepared a notice of exemption. A comment period for the project was held from February 25 through March 27, 2003. A public meeting was held on March 11, 2003. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: PROJECT WIDE

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Sub Area Name:	Not reported
Completed Document Type:	Amendment - Order/Agreement
Completed Date:	03/10/2000
Comments:	The Department issued a conditional approval for modification of the abandonment procedures for water supply well WSW-5 and abandonment of selcted monitoring and extraction wells and shutdown of the Drum Storage Area and Ponds and Ditch Study Area RCRA Unit groundwater treatment systems. The Drum Storage Area and Ponds and Ditch Study Area RCRA Units are to be incorporated into the CERCLA Study areas (Northern Shops Study Area for Former Drum Storage Area and Lagoon Study Area of Ponds and Ditch), although will maintain its unique RCRA identity as subsections in future CERCLA monitoring, letters and reports.
Future Area Name:	PROJECT WIDE
Future Sub Area Name:	Not reported
Future Document Type:	5 Year Review Reports
Future Due Date:	2020
Schedule Area Name:	PROJECT WIDE
Schedule Sub Area Name:	Not reported
Schedule Document Type:	5 Year Review Reports
Schedule Due Date:	06/30/2015
Schedule Revised Date:	Not reported
Facility ID:	34400006
Site Type:	State Response
Site Type Detail:	State Response or NPL
Acres:	40
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP, RWQCB 5R - Central Valley
Lead Agency Description:	Not reported
Project Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Site Code:	100139
Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	07
Senate:	06
Special Program Status:	* RCRA 3012 - Past Haz Waste Disp Inven Site
Status:	Certified O&M - Land Use Restrictions Only
Status Date:	11/03/2010
Restricted Use:	YES
Funding:	Responsible Party
Latitude:	38.58452
Longitude:	-121.5008
APN:	00200100440000
Past Use:	RAILROAD RIGHT OF WAY
Potential COC :	* HALOGENATED ORGANIC COMPOUNDS * CONTAMINATED SOIL * UNSPECIFIED OIL CONTAINING WASTE Lead
Confirmed COC:	NONE SPECIFIED
Potential Description:	SOIL
Alias Name:	SACRAMENTO RAILYARD FACILITY
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC TRANSPORTATION CO
Alias Type:	Alternate Name

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Alias Name:	SP, SAC - SACRAMENTO STATION
Alias Type:	Alternate Name
Alias Name:	SP-SAC - LOCOMOTIVE WORKS
Alias Type:	Alternate Name
Alias Name:	SP-SAC - OVERALL SITE
Alias Type:	Alternate Name
Alias Name:	UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type:	Alternate Name
Alias Name:	00200100440000
Alias Type:	APN
Alias Name:	CAD073772030
Alias Type:	EPA Identification Number
Alias Name:	110000609770
Alias Type:	EPA (FRS #)
Alias Name:	110012532170
Alias Type:	EPA (FRS #)
Alias Name:	110033620295
Alias Type:	EPA (FRS #)
Alias Name:	T10000001979
Alias Type:	GeoTracker Global ID
Alias Name:	100174
Alias Type:	Site Code - Historical
Alias Name:	P14013
Alias Type:	PCode
Alias Name:	100139
Alias Type:	Project Code (Site Code)
Alias Name:	34400004
Alias Type:	Envirostor ID Number
Alias Name:	34400006
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Action Completion Report
Completed Date:	06/02/1994
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Design/Implementation Workplan
Completed Date:	05/30/1992
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Removal Action Completion Report
Completed Date:	04/10/1991
Comments:	COVER
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Removal Action Completion Report
Completed Date:	04/10/1991
Comments:	SOIL
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Document Type: Remedial Action Plan
Completed Date: 12/30/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 08/30/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 02/28/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/09/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/19/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/29/2010
Comments: Not reported

Completed Area Name: Mainline Track
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 08/20/2012
Comments: 8/20/2012 approval of 8/8/2012 workplan that revised a 6/15/2012 workplan

Completed Area Name: Lot 41
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 02/27/2013
Comments: 2/27/2013 DTSC Approval of 2/4/2013 Addendum to 1/2/2013 Workplan

Completed Area Name: Lot 41
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 08/29/2013
Comments: Not reported

Completed Area Name: Lot 41
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 01/21/2014

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Comments: Lot 41 was remediated to remedial goals. Backfill was approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 05/19/1994
Comments: The deed restriction indicates that the property can be used without restriction for: 1) industrial uses and 2) the landscaped and paved areas ancillary to the industrial, commercial or office structures that are covered with 2 feet of clean soil, if not used for play areas. Restricted uses include 1) excavation for any purpose other than remediation 2) residental, 3) public or institutional uses 4) educational 5) day care 6) parks, playgrounds water features, open space, yards, gardens and landscaped areas. Soil must be managed as approved by the Department and instructure improvements must be developed consistent with the Deed restriction. In the industrial use areas, where exposure to soils is possible, such as landscaped area or easements, the owner shall maintain the 2-foot clean soil cover. If additional contamination is found during development, adequate measures must be taken to acheive permanent remediation and prevent unacceptable exposure to humans or the environment. The soil disposal shall be managed in accordance with all applicable state and federal laws. No water No water from below the surface shall be extracted or utilized in any way or consumed, although access will be allowed for groundwater monitoring and extraction systems for Union Pacific, it successors or agents, and the Department for monitoring, inspection, and other activities.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 06/02/1994
Comments: FRA/DEED/CERT -- the site has been certified for soil remedial activities under the Remedial Action Plan. A Deed Restriction has been recorded which limits land use to commercial and industrial uses. Volume Recycled/Reused: 16,300 cubic yds Volume Disposed: 19,300 cubic yds Total Volume Treated/Stab/Disposed: 35,600 cubic yds # Acres of land returned/released: 37 acres

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 02/02/1989
Comments: AGREEMENT

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 06/02/1988
Comments: Enforceable Agreement

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: 5 Year Review Reports
Future Due Date: 2020
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Schedule Document Type:	5 Year Review Reports
Schedule Due Date:	06/30/2015
Schedule Revised Date:	Not reported
Facility ID:	34400007
Site Type:	State Response
Site Type Detail:	State Response or NPL
Acres:	50
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP, RWQCB 5R - Central Valley
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Site Code:	100139
Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	07
Senate:	06
Special Program Status:	* RCRA 3012 - Past Haz Waste Disp Inven Site
Status:	Active
Status Date:	01/01/1990
Restricted Use:	NO
Funding:	Responsible Party
Latitude:	38.58653
Longitude:	-121.4998
APN:	00200100440000
Past Use:	RAIL ROAD MAINTENANCE SHOP
Potential COC :	* HALOGENATED ORGANIC COMPOUNDS * OIL/WATER SEPARATION SLUDGE * ORGANIC LIQUIDS WITH METALS * CONTAMINATED SOIL * UNSPECIFIED OIL CONTAINING WASTE * WASTE OIL & MIXED OIL * ORGANIC LIQUIDS (NONSOLVENTS) WITH HALOGENS Benzene Lead Polynuclear aromatic hydrocarbons (PAHs Tetrachloroethylene (PCE TPH-diesel TPH-JET FUEL TPH-MOTOR OIL 1,1,1-Trichloroethane (TCA Trichloroethylene (TCE Vinyl chloride Acetone 1,1-Dichloroethane 1,1-Dichloroethylene 1,2-Dichloroethylene (cis 1,2-Dichloroethylene (trans Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene Toluene Xylenes
Confirmed COC:	* ORGANIC LIQUIDS (NONSOLVENTS) WITH HALOGENS * UNSPECIFIED OIL CONTAINING WASTE * WASTE OIL & MIXED OIL Benzene * HALOGENATED ORGANIC COMPOUNDS Lead * OIL/WATER SEPARATION SLUDGE * ORGANIC LIQUIDS WITH METALS 10097-NO 30472-NO 30473-NO 30474-NO 30475-NO 30476-NO 30477-NO 30478-NO 30479-NO 30480-NO 30481-NO 30482-NO 30483-NO 30484-NO 30485-NO 30019-NO 30022-NO 30024-NO 30026-NO 30027-NO 30028-NO 30032-NO 30192-NO 30194-NO 30195-NO 30196-NO 30550-NO 3002501-NO 3002502-NO 30593-NO
Potential Description:	SOIL
Alias Name:	SACRAMENTO RAILYARD FACILITY
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC TRANSPORTATION CO
Alias Type:	Alternate Name
Alias Name:	SP, SAC - NORTHERN SHOPS
Alias Type:	Alternate Name
Alias Name:	SP, SAC - NORTHERN SHOPS/DRUM STORAGE
Alias Type:	Alternate Name
Alias Name:	SP-SAC - DRUM STORAGE AREA

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Alias Type:	Alternate Name
Alias Name:	SP-SAC - LOCOMOTIVE WORKS
Alias Type:	Alternate Name
Alias Name:	SP-SAC - OVERALL SITE
Alias Type:	Alternate Name
Alias Name:	UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type:	Alternate Name
Alias Name:	UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S
Alias Type:	Alternate Name
Alias Name:	00200100440000
Alias Type:	APN
Alias Name:	CAD073772030
Alias Type:	EPA Identification Number
Alias Name:	110000609770
Alias Type:	EPA (FRS #)
Alias Name:	110012532170
Alias Type:	EPA (FRS #)
Alias Name:	110033620295
Alias Type:	EPA (FRS #)
Alias Name:	T10000001965
Alias Type:	GeoTracker Global ID
Alias Name:	P14032
Alias Type:	PCode
Alias Name:	100139
Alias Type:	Project Code (Site Code)
Alias Name:	34400004
Alias Type:	Envirostor ID Number
Alias Name:	34400007
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Action Plan
Completed Date:	05/08/2003
Comments:	RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safety clean up of asbestos if found during future soil excavation. In compliance with CEQA, DTSC has prepared a notice of exemption. A comment period for the project was held from February 25 through March 27, 2003. A public meeting was held on March 11, 2003. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Action Completion Report
Completed Date:	06/30/2010
Comments:	Not reported

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Design/Implementation Workplan
Completed Date:	05/22/2000
Comments:	DES - The DTSC approved the Final Remediation Design and Implementation Report (RDIP) on May 22, 2000, for the Northern Shops Study

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Area.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 02/16/2000
Comments: RAP - The DTSC approved the Final RAP, dated February 14, 2000, for the Northern Shops Study Area, which consists of 35 acres of the 240 acre SPTCo-Sacramento Rail Yard Site. The approved alternative for remediation for the 180,650 cubic yards of contaminated soils identified the RAP is excavation, land farming, chemical stabilization and, off-site disposal. Implementation of the selected alternative is schedule to begin in May of 2000 and to continue through October of 2005. The preliminary cost of the proposed alternative is estimated to be $14,353,374. CEQA/NOD - The DTSC approved the Notice of Determination for the LSA Final Amended (FARAP), and the NSSA, CSNSA, and CCSA Final Remedial Action Plan (FRAP) on February 16, 2000.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 12/31/1998
Comments: RI/FS -- THE NORTHERN SHOPS STUDY AREA (NSSA) REPRESENTS APPROXIMATELY 35 ACRES OF THE 240-ACRE SPTCO-SACRAMENTO RAILYARD. THE APPROVED RIFS HAS INITIALLY IDENTIFIED 180,000 CUBIC YARDS OF CONTAMINATED SOILS THAT WILL REQUIRE OFFSITE DISPOSAL.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedy Constructed: Operating Properly & Successfully
Completed Date: 09/15/1994
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedy Constructed: Operating Properly & Successfully
Completed Date: 09/15/1994
Comments: Drum Storage Area Groundwater Treatment System Construction completed

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedy Constructed: Operating Properly & Successfully
Completed Date: 09/15/1994
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedy Constructed: Operating Properly & Successfully
Completed Date: 09/15/1994
Comments: FRA (DSVS1) and FRA (DSGW) -- The groundwater extraction and treatment and soil vapor extraction and treatment systems have been constructed at the former drum storage area facility. Normal operation of the systems began 09/15/1994.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Document Type: CEQA - Notice of Exemption
Completed Date: 05/07/2003
Comments: CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine, and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safely clean up asbestos if found during future soil excavation. A comment period for the project was held from 2/25/03 to 3/27/03. A public meeting was held on 3/11/03. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 02/16/2000
Comments: Notice of Determination

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement
Completed Date: 07/08/1996
Comments: ORDER (DOS&M) -- An Enforceable Agreement was completed for the Operation and Maintenance of the groundwater and vapor extraction systems at the former drum storage area facility.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 07/30/1987
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Design
Completed Date: 03/09/1994
Comments: DESIGN (DSVSI) and DESIGN (DSGWI)--The designs approved extraction and treatment of VOCs and TPH in soil and groundwater at the former drum storage area facility.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 06/30/1992
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 01/07/1992
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 06/08/1990
Comments: Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 02/28/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Notice
Completed Date: 07/18/2003
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: 5 Year Review Reports
Completed Date: 05/02/2008
Comments: Additional work proposed as a result of 5yr review equivelent effort.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Implementation Workplan
Completed Date: 02/01/2003
Comments: Asbestos Contingiency Plan

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 03/01/2009
Comments: Fieldwoek performed in accordance with project documents. Results will be reported in 2007-2009 Soil Summary Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Implementation Workplan
Completed Date: 05/02/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 09/17/2009
Comments: Not reported

Completed Area Name: Track 150
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 09/23/2014
Comments: Not reported

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: 5 Year Review Reports
Future Due Date: 2020
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Certification
Future Due Date: 2015

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Schedule Area Name:	PROJECT WIDE
Schedule Sub Area Name:	Not reported
Schedule Document Type:	5 Year Review Reports
Schedule Due Date:	06/30/2015
Schedule Revised Date:	Not reported
Schedule Area Name:	PROJECT WIDE
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Land Use Restriction
Schedule Due Date:	06/30/2015
Schedule Revised Date:	Not reported

EMI:

Year:	1987
County Code:	34
Air Basin:	SV
Facility ID:	38
Air District Name:	SAC
SIC Code:	4742
Air District Name:	SACRAMENTO METROPOLITAN AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	55
Reactive Organic Gases Tons/Yr:	35
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	1990
County Code:	34
Air Basin:	SV
Facility ID:	38
Air District Name:	SAC
SIC Code:	4742
Air District Name:	SACRAMENTO METROPOLITAN AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	17
Reactive Organic Gases Tons/Yr:	12
Carbon Monoxide Emissions Tons/Yr:	1
NOX - Oxides of Nitrogen Tons/Yr:	3
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	1995
County Code:	34
Air Basin:	SV
Facility ID:	38
Air District Name:	SAC
SIC Code:	4742
Air District Name:	SACRAMENTO METROPOLITAN AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	4
Reactive Organic Gases Tons/Yr:	3

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	1996
County Code:	34
Air Basin:	SV
Facility ID:	38
Air District Name:	SAC
SIC Code:	4742
Air District Name:	SACRAMENTO METROPOLITAN AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	4
Reactive Organic Gases Tons/Yr:	3
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	1997
County Code:	34
Air Basin:	SV
Facility ID:	38
Air District Name:	SAC
SIC Code:	4742
Air District Name:	SACRAMENTO METROPOLITAN AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	4
Reactive Organic Gases Tons/Yr:	3
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

ENVIROSTOR:

Facility ID:	60001378
Status:	Active
Status Date:	12/01/2009
Site Code:	102074
Site Type:	State Response
Site Type Detailed:	State Response or NPL
Acres:	31
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.58585
Longitude: -121.5016
APN: NONE SPECIFIED
Past Use: RAIL ROAD MAINTENANCE SHOP
Potential COC: Asbestos Containing Materials (ACM Lead
Confirmed COC: Lead Asbestos Containing Materials (ACM
Potential Description: CSS, IA
Alias Name: 102074
Alias Type: Project Code (Site Code)
Alias Name: 60001378
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consent Order
Completed Date: 06/02/1988
Comments: Enforceable Agreement dated June 2, 1988

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 11/08/2010
Comments: On November 8, 2010, DTSC confirmed the completion of lead and asbestos abatement activities within several historic buildings within the Central Shops at the Sacramento Railyards. The abatement work was done in coordination with historic preservation requirements and under contract terms with the California Pollution Control Financing Authority (CPCFA) for Prop 1C Brownfields grant money. CPCFA had requested DTSC, as lead agency, provide oversight and confirmation of completion of the activities anticipated by the grant award. The purpose of the abatement was to conduct environmental mitigation of hazardous materials to practical levels that accommodate rehabilitation of the buildings, including general construction activities or intrusive access and use. Remedial goals that were established for lead and asbestos were achieved.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

Facility ID: 60001447
Status: No Further Action
Status Date: 03/17/2014
Site Code: 102140
Site Type: State Response
Site Type Detailed: State Response or NPL
Acres: 17.46
NPL: NO

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Regulatory Agencies: SMBRP, RWQCB 5R - Central Valley
Lead Agency: SMBRP
Program Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: YES
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.58585
Longitude: -121.5016
APN: NONE SPECIFIED
Past Use: RAIL ROAD MAINTENANCE SHOP, RAILROAD RIGHT OF WAY
Potential COC: Asbestos Containing Materials (ACM Benzene Polynuclear aromatic hydrocarbons (PAHs TPH-diesel TPH-gas TPH-MOTOR OIL 1,1,1-Trichloroethane (TCA Trichloroethylene (TCE Vinyl chloride Acetone Ethylbenzene Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene Toluene Xylenes
Confirmed COC: Benzene Polynuclear aromatic hydrocarbons (PAHs TPH-diesel TPH-gas 1,1,1-Trichloroethane (TCA Acetone Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Chrysene Fluoranthene Naphthalene Pyrene Ethylbenzene Toluene TPH-MOTOR OIL Xylenes Benz[a]anthracene Benzo[a]pyrene Dibenz[ah]anthracene Indeno[1,2,3-cd]pyrene Asbestos Containing Materials (ACM Trichloroethylene (TCE Fluorene Vinyl chloride
Potential Description: OTH, SOIL, SV
Alias Name: 102140
Alias Type: Project Code (Site Code)
Alias Name: 60001447
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consent Order
Completed Date: 06/02/1988
Comments: Enforceable Agreement dated June 2, 1988

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 11/30/2012
Comments: DTSC sent letter via email to Stantec (City's consultant) regarding basin.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 06/09/2011
Comments: Transfer Notice of Property from Inland to City

Completed Area Name: PROJECT WIDE

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 07/27/2011
Comments: City Track Reloc Soil Management Plan

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 08/20/2011
Comments: City Soil and Groundwater Monthly Report

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 06/25/2012
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 06/25/2012
Comments: Not reported

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Certification
Future Due Date: 2016
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Land Use Restriction
Future Due Date: 2015
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

Facility ID: 34400008
Status: Active
Status Date: 06/03/1992
Site Code: 100139
Site Type: State Response
Site Type Detailed: State Response or NPL
Acres: 40
NPL: NO
Regulatory Agencies: SMBRP, RWQCB 5R - Central Valley
Lead Agency: SMBRP
Program Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: YES
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.58950

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Longitude: -121.4968
APN: 002-0010-005, 002-0010-033, 002-0010-034, 00200100440000
Past Use: RAIL ROAD MAINTENANCE SHOP
Potential COC: * HALOGENATED ORGANIC COMPOUNDS * OIL/WATER SEPARATION SLUDGE * OTHER ORGANIC SOLIDS * CONTAMINATED SOIL * UNSPECIFIED OIL CONTAINING WASTE * WASTE OIL & MIXED OIL Arsenic Benzene Lead Tetrachloroethylene (PCE TPH-diesel TPH-gas TPH-MOTOR OIL 1,1,1-Trichloroethane (TCA Trichloroethylene (TCE Vinyl chloride 1,4-Dioxane Ethylbenzene Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene Toluene Xylenes
Confirmed COC: * UNSPECIFIED OIL CONTAINING WASTE * WASTE OIL & MIXED OIL Arsenic Benzene * HALOGENATED ORGANIC COMPOUNDS Lead * OIL/WATER SEPARATION SLUDGE * OTHER ORGANIC SOLIDS * CONTAMINATED SOIL Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene Tetrachloroethylene (PCE TPH-diesel TPH-gas 1,1,1-Trichloroethane (TCA Trichloroethylene (TCE Vinyl chloride 1,4-Dioxane Ethylbenzene Toluene TPH-MOTOR OIL Xylenes
Potential Description: AQUI, SOIL
Alias Name: SACRAMENTO RAILYARD FACILITY
Alias Type: Alternate Name
Alias Name: SOUTHERN PACIFIC
Alias Type: Alternate Name
Alias Name: SOUTHERN PACIFIC TRANSPORTATION CO
Alias Type: Alternate Name
Alias Name: SP, SAC - LAGOON
Alias Type: Alternate Name
Alias Name: SP-SAC - LOCOMOTIVE WORKS
Alias Type: Alternate Name
Alias Name: SP-SAC - OVERALL SITE
Alias Type: Alternate Name
Alias Name: UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type: Alternate Name
Alias Name: UP, DOWNTOWN SAC - LAGOON
Alias Type: Alternate Name
Alias Name: 002-0010-005
Alias Type: APN
Alias Name: 002-0010-033
Alias Type: APN
Alias Name: 002-0010-034
Alias Type: APN
Alias Name: 00200100440000
Alias Type: APN
Alias Name: 110000609770
Alias Type: EPA (FRS #)
Alias Name: 110033620295
Alias Type: EPA (FRS #)
Alias Name: T10000001833
Alias Type: GeoTracker Global ID
Alias Name: T10000001982
Alias Type: GeoTracker Global ID
Alias Name: 100139
Alias Type: Project Code (Site Code)

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Alias Name: 34400004
Alias Type: Envirostor ID Number
Alias Name: 34400008
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: NW Corner
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Initial Study/ Neg. Declaration
Completed Date: 09/28/2006
Comments: Not reported

Completed Area Name: Soil
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 07/29/2004
Comments: DES/RDIP -- DESIGN/REMEDIAL DESIGN IMPLEMENTATION PLAN. THE LAGOON STUDY AREA (LSA) IS APPROXIMATELY 434 ACRES OF THE 240 ACRE FORMER SPTCO RAIL YARD LOCATED IN DOWNTOWN SACRAMENTO. THE LSA WAS UTILIZED FOR AS AN INDUSTRIAL WASTEWATER LAGOON, OIL/ WATER SEPERATOR OVERFLOW AREA, AND FORMER LOCATION OF A 50,000 GALLON OIL STORAGE TANK. THE RDIP 2004 PROVIDES FOR EXCAVATIONS, STORAGE, TREATMENT, AND OFFSITE DISPOSAL OF APPROXIMATELY 120,000 CUBIC YARDS OF SOIL CONTAMINATED VOLATILE ORGANIC COMPOUNDS SVOCs, AND TOTAL PETROLEUM HYDROCARBON (TPH) IN THE LAGOON STUDY AREA, AND CENTRAL CORRIDOR STUDY AREA, AND CAR SHOP NINE STUDY AREA FOR WHICH REMEDIAL ACTION PLANS (RAPs) HAVE BEEN PREVIOUSLY APPROVED.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 05/08/2003
Comments: RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safety clean up of asbestos if found during future soil excavation. In compliance with CEQA, DTSC has prepared a notice of exemption. A comment period for the project was held from February 25 through March 27, 2003. A public meeting was held on March 11, 2003. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: Soil
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 02/16/2000
Comments: Final Amended RAP approved for soil

Completed Area Name: Soil
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 05/22/2000
Comments: DES - The DTSC approved the Final Remediation Design and Implementation Report (RDIP) for Soil on May 22, 2000, for the Lagoon Study Area, 51 acres of the 240 acre SPTCo - Sacramento Rail Yard Site. The approved RDIP for remediation for the 239,640 cubic yards of contaminated soils consists of excavation, ex-situ vapor

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

extraction, chemical stabilization and, off-site disposal. Implementation of the RDIP is scheduled to begin in May of 2000, and to continue through October of 2005. The preliminary costs of the remediation is estimated to be $17,115,480.

Completed Area Name: Soil
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 12/30/1998
Comments: RAP -- DTSC APPROVED THE FINAL RAP, DATED 12/28/98, APPROVED 12/30/98, FOR THE LSA 51 ACRES OF THE 240-ACRE SPTCO-SACRAMENTO RAILYARD SITE. THE APPROVED ALTERNATIVE FOR REMEDIATION FOR THE 239,640 CUBIC YARDS OF CONTAMINATED SOILS IDENTIFIED IN THE RAP IS EXCAVATION, EX-SITU VAPOR EXTRACTION, CHEMICAL STABILIZATION, ONSITE SECURE CONTAINMENT AND OFFSITE DISPOSAL. THE ONSITE DISPOSAL ALTERNATIVE INCLUDES DESIGN AND CONSTRUCTION OF AN ONSITE, 450,000 CUBIC YARD SOLD WASTE LANDFILL, PRIMARILY DESIGNED FOR RELATIVELY INERT METALS CONTAMINATED SOILS. THE LANDFILL WILL BE DESIGNED AND CONSTRUCTED AS A CLASS II LANDFILL. THE ONSITE LANDFILL HAS BEEN APPROVED WITH THE FOLLOWING REQUIREMENTS: NO LIQUIDS MAY BE DISPOSED ONSITE, ALL METAL CONTAMINATED SOILS WITH ORGANICS MAY ONLY BE PLACED IN THE LANDFILL IF THE ORGANIC CONSTITUENTS ARE ALL LESS THAN THRESHOLD VALUES, NO RCRA WASTES, AND NO CALIFORNIA HAZARDOUS WASTE THAT HAS NOT BEEN CLASSIFIED AS DESIGNATED WASTE. IMPLEMENTATION OF THE SELECTED ALTERNATIVE IS SCHEDULED TO BEGIN IN APRIL OF 2000 AND TO CONTINU THROUGH OCTOBER OF 2005. THE PRELIMINARY COST OF THE PROPOSED ALTERNATIVE IS EXTIMATED TO BE $20,315,000.

Completed Area Name: Soil
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 11/25/1997
Comments: RIFS -- Soil FS approved. LSA represents 51 acres of the 240 acre SPTCo- Sacramento Rail Yard. The approved RIFS has initially identified 51,965 cubic yards of contaminated soils that will require offsite disposal and 187,675 cubic yards of contaminated soils that will be disposed of onsite. The onsite disposal alternative includes design and construction of an onsite 450,000 cubic yard solid waste landfill, primarily designed for relatively intert metals contaminated soils. The landfill will be designed and constucted as a Class II landfill. The onsite landfill has been approved with the following requirements: no liquids may be disposed of onsite, all metal contaminated soils with organics may only be placed in the landfill if the organic constituents are all less than threshold values, no RCRA waste, and no California Hazardous Waste that has not been classified as designated waste. The preliminary cost of the proposed alternative, Alternative H, is $20,315,000. The final RAP is scheduled for completion in September 1998.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 04/27/1995
Comments: RA (LSARA) -- The Interim Remedial Measure (IRM) is being implemented for remediation of soil contaminated with Volatile Organic Compounds (VOC's), Semi-Volatile Organic Compounds (SVOC's), and metals from operation and maintenance activities at the SPTCo-Sacramento Rail

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Yard. The IRM consists of excavation remediation of approximately 2500 cubic yards of contaminated soils from the Industrial Waste Water Lagoon. The contaminated soil will be stockpiled and treated at the Drum Storage Area (DSA utilizing the existing DSA soil vapor extraction and treatme system to remediate VOC contamination. The VOC remediated soils will then be chemically stabilized/solidified to treat SVOC and metal contamination. The remediated/stabilized soil will then be disposed of at the ECDC Utah Landfill.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 10/06/1993
Comments: Not reported

Completed Area Name: NW Corner
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan w/ESD
Completed Date: 09/13/2006
Comments: Not reported

Completed Area Name: NW Corner
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan Amendment
Completed Date: 02/21/2003
Comments: RAP/NWLSA--DTSC approved a RAP amendment for soil cleanup of an 11 acre portion of the Lagoon Study Area (LSA) of the railyard site. The Amendment to the 2000 Final Amended Industrial Wastewater Lagoon Remedial Action Plan for Soil changes the remedy for the northwestern corner of the LSA from excavation and offsite disposal to grading and capping with an engineered paved cover. Land use will be limited under a deed restriction. In compliance with CEQA, DTSC has prepared a Notice of Determination (NOD) for this project. A comment period for the project was held from February 25 through March 27, 2003. A public meeting was held on March 11, 2003. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: NW Corner
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 06/06/2007
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Implementation Workplan
Completed Date: 02/01/2003
Comments: Asbestos Contingency Plan

Completed Area Name: NW Corner
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Implementation Workplan
Completed Date: 03/28/2007
Comments: Implementation Plan Approved

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Document Type: Remedial Investigation Workplan
Completed Date: 01/05/2008
Comments: dddd

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 02/22/2010
Comments: Not reported

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 09/17/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 06/30/2010
Comments: Not reported

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 04/26/2011
Comments: Sent email approval on 2/15/2011 for well abandoment, and on 4/26/2011 for well replacement locations.

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 10/03/2011
Comments: Not reported

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 02/01/2012
Comments: Not reported

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 10/17/2014
Comments: Not reported

Completed Area Name: Groundwater
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 01/30/2015
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 05/07/2003

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Comments:	CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine, and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safely clean up asbestos if found during future soil excavation. A comment period for the project was held from 2/25/03 to 3/27/03. A public meeting was held on 3/11/03. Public comments were received by DTSC and addressed through a responsiveness summary.
Completed Area Name:	NW Corner
Completed Sub Area Name:	Not reported
Completed Document Type:	CEQA - Responsible Agency Review
Completed Date:	05/07/2003
Comments:	CEQA/NOD--An NOD was approved for actions selected under a Remedial Action Plan Amendment prepared for soil remediation of an 11 acre Northwestern portion of the Lagoon Study Area. DTSC prepared an Initial Study Agency Checklist which relies on the City of Sacramento EIRs prepared for redevelopment projects which includes the Railyard. The NOD and supporting evaluations were made available for public review for 30 days from 2/25/03 to 3/27/03 and was presented at the 3/11/03 public meeting held at the Sacramento Amtrak Depot. A notice was displayed in the Sacramento Bee newspaper and a fact sheet was mailed to the site mailing list to provide information and announce the review period and a public meeting.
Completed Area Name:	7th Street Corridor
Completed Sub Area Name:	Not reported
Completed Document Type:	Land Use Restriction
Completed Date:	07/11/2001
Comments:	The 7th Street Corridor deed restriction prohibits land uses including residental, hospital, public or private schools for persons uncer 18 years of age, day care centers, raising of food, drilling for water, and extraction of groundwater. No activities are allowed that will disturb the soil without a soils management plan and health and safety plan and contaminated soils brought to the surface shall be managed in accordance with all applicable state and federal laws. The deed restriction also allows access for the Department for monitoring, inspection, and other activities.
Completed Area Name:	Soil
Completed Sub Area Name:	Not reported
Completed Document Type:	CEQA - Responsible Agency Review
Completed Date:	02/16/2000
Comments:	CEQA/NOD - The DTSC approved the Notice of Determination for the LSA Final Amended (FARAP) for Soil, and the NSSA, CSNSA, and CCSA Final Remedial Action Plan (FRAP) for Soil.
Completed Area Name:	Soil
Completed Sub Area Name:	Not reported
Completed Document Type:	CEQA - Responsible Agency Review
Completed Date:	12/30/1998
Comments:	CEQA - The DTSC issued the Notice of Determination for the Lagoon Study Area Final RAP, approved remedial alternative on December 30, 1999.
Completed Area Name:	PROJECT WIDE

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Sub Area Name:	Not reported
Completed Document Type:	Consent Order
Completed Date:	06/02/1988
Comments:	Not reported
Future Area Name:	Soil
Future Sub Area Name:	Not reported
Future Document Type:	Certification
Future Due Date:	2015
Future Area Name:	Groundwater
Future Sub Area Name:	Not reported
Future Document Type:	Land Use Restriction
Future Due Date:	2018
Future Area Name:	Groundwater
Future Sub Area Name:	Not reported
Future Document Type:	Certification
Future Due Date:	2018
Future Area Name:	NW Corner
Future Sub Area Name:	Not reported
Future Document Type:	Remedial Action Completion Report
Future Due Date:	2016
Future Area Name:	Groundwater
Future Sub Area Name:	Not reported
Future Document Type:	Design/Implementation Workplan
Future Due Date:	2017
Future Area Name:	Groundwater
Future Sub Area Name:	Not reported
Future Document Type:	Remedial Action Plan
Future Due Date:	2016
Future Area Name:	NW Corner
Future Sub Area Name:	Not reported
Future Document Type:	Operations and Maintenance Plan
Future Due Date:	2017
Future Area Name:	Groundwater
Future Sub Area Name:	Not reported
Future Document Type:	Feasibility Study Report
Future Due Date:	2016
Future Area Name:	NW Corner
Future Sub Area Name:	Not reported
Future Document Type:	Design/Implementation Workplan
Future Due Date:	2015
Future Area Name:	Soil
Future Sub Area Name:	Not reported
Future Document Type:	5 Year Review Reports
Future Due Date:	2020
Schedule Area Name:	Soil
Schedule Sub Area Name:	Not reported
Schedule Document Type:	5 Year Review Reports
Schedule Due Date:	06/30/2015
Schedule Revised Date:	Not reported
Schedule Area Name:	Soil
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Land Use Restriction
Schedule Due Date:	06/30/2015
Schedule Revised Date:	Not reported

Facility ID: 34400009

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Status:	Active
Status Date:	06/03/1992
Site Code:	100139
Site Type:	State Response
Site Type Detailed:	State Response or NPL
Acres:	40
NPL:	NO
Regulatory Agencies:	SMBRP, RWQCB 5R - Central Valley
Lead Agency:	SMBRP
Program Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	Not reported
Restricted Use:	YES
Site Mgmt Req:	NONE SPECIFIED
Funding:	Responsible Party
Latitude:	38.58946
Longitude:	-121.4996
APN:	002-0010-005, 002-0010-033, 002-0010-034, 00200100440000
Past Use:	RAIL ROAD MAINTENANCE SHOP
Potential COC:	* HALOGENATED ORGANIC COMPOUNDS * CONTAMINATED SOIL * UNSPECIFIED OIL CONTAINING WASTE Lead
Confirmed COC:	NONE SPECIFIED
Potential Description:	SOIL
Alias Name:	SACRAMENTO RAILYARD FACILITY
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC TRANSPORTATION COMPANY
Alias Type:	Alternate Name
Alias Name:	SP, SAC - CAR SHOP NINE
Alias Type:	Alternate Name
Alias Name:	SP-SAC - LOCOMOTIVE WORKS
Alias Type:	Alternate Name
Alias Name:	SP-SAC - OVERALL SITE
Alias Type:	Alternate Name
Alias Name:	UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type:	Alternate Name
Alias Name:	002-0010-005
Alias Type:	APN
Alias Name:	002-0010-033
Alias Type:	APN
Alias Name:	002-0010-034
Alias Type:	APN
Alias Name:	00200100440000
Alias Type:	APN
Alias Name:	110000609770
Alias Type:	EPA (FRS #)
Alias Name:	110033620295
Alias Type:	EPA (FRS #)
Alias Name:	T10000001834
Alias Type:	GeoTracker Global ID
Alias Name:	100139
Alias Type:	Project Code (Site Code)
Alias Name:	34400004
Alias Type:	Envirostor ID Number
Alias Name:	34400009

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Alias Type: Envirostor ID Number

Completed Info:

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 07/29/2004
Comments: DES/RDIP -- DESIGN/REMEDIAL DESIGN IMPLEMENTATION PLAN. THE CAR SHOP NINE STUDY AREA (CSNSA) IS APPROXIMATELY 44 ACRES OF THE 240 ACRE FORMER SPTCO RAIL YARD LOCATED IN DOWNTOWN SACRAMENTO. THE CSNSA WAS UTILIZED FOR CONSTRUCTING AND PAINTING RAIL CARS; SANDBLASTING; GENERAL OFFICES; AND RAIL YARD OPERATIONS. THE RDIP 2004 PROVIDES FOR EXCAVATIONS, STORAGE, TREATMENT, AND OFFSITE DISPOSAL OF APPROXIMATELY 120,000 CUBIC YARDS OF SOIL CONTAMINATED VOLATILE ORGANIC COMPOUNDS (VOCs), SVOC, AND TOTAL PETROLEUM HYDROCARBON (TPH) IN THE CAR SHOP NINE STUDY AREA, LAGOON STUDY AREA, AND CENTRAL CORRIDOR STUDY AREA FOR WHICH REMEDIAL ACTION PLANS (RAPs) HAVE BEEN PREVIOUSLY APPROVED.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 05/08/2003
Comments: RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safety clean up of asbestos if found during future soil excavation.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 01/30/2009
Comments: Soil remedial action met the cleanup levels.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 05/22/2000
Comments: DES - The DTSC approved the Final Remediation Design and Implementation Report (RDIP) on May 22, 2000, for the Car Shop Nine Study Area, 40 acres of the 240 acre SPTCo - Sacramento Rail Yard Site. The approved RDIP is for the 132,718 cubic yards of contaminated soils consists of excavation, land farming, chemical stabilization and, off-site disposal. Implementation of the RDIP is scheduled to begin in May of 2000, and to continue through October of 2005. The preliminary costs of the proposed alternative is estimated to be 8,050,957.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 02/16/2000
Comments: RAP - The DTSC approved the Final RAP, for the Car Shop Nine Study Area, which consists of 40 acres of the 240 acre SPTCo- Sacramento Rail Yard site. The approved alternative for approved alternative for remediation for the 132,718 cubic yards of contaminated soils

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

identified in the RAP is excavation, land farming, chemical stabilization and off-site disposal. Implementation of selected alternative is scheduled to being in May of 2000 and to continue through October of 2005. The preliminary cost of the proposed alternative is estimated to be $8,050,957. CEQA/NOD -

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 02/20/2003
Comments: CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine, and Northern Shops RAP for Soil. A comment period for the project was held from February 25 through March 27, 2003. A public meeting was held on March 11, 2003. Public comments were received by DTSC and addressed through a responsiveness summary. The ACP establishes the process to identify the presence of and safely clean up asbestos if found during future soil excavation. A comment period for the project was held from 2/25/03 to 3/27/03. A public meeting was held on 3/11/03. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 07/11/2001
Comments: The 7th Street Corridor deed restriction prohibits land uses including residental, hospital, public or private schools for persons uncer 18 years of age, day care centers, raising of food, drilling for water, and extraction of groundwater. No activities are allowed that will disturb the soil without a soils management plan and health and safety plan and contaminated soils brought to the surface shall be managed in accordance with all applicable state and federal laws. The deed restriction also allows access for the Department for monitoring, inspection, and other activities.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Initial Study/ Environmental Impact Report
Completed Date: 02/16/2000
Comments: CEQA/NOD - The DTSC approved the Notice of Determination for the LSA Final Amended (FARAP), and the NSSA, CSNSA, and CCSA Final Remedial Action Plan (FRAP).

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 10/05/1998
Comments: RI/FS -- The Union Pacific Railroad Company has completed soil characterization of the former Southern Pacific Transportation Company - Sacramento Railyard Car Shop Nine Study Area (CSNSA). Groundwater contamination for the CSNSA will be addressed within the Lagoon Groundwater and Central Shops South Plume RI/FS and RAP. The CSNSA was utilized for constructing rail cars, painting rail cars, sandblasting, general offices and railyard operations buildings. Additionally, five Underground Storage Tanks were located at the

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

CSNSA. During Phase I characterization, soil gas samples were collected from 11 locations, 31 soil borings were drilled and sampled, andgroundwater samples were collected from 24 locations. During Phase II, the final Phase 25 additional soil borings were drilled. Compounds of concern (COC'S) detected in the soil included VOC'S-VC and TCE, SVOC'S-PNA'S, Anthracene and Chrysene, TPH-#2 and #6 fuel oil, oil and grease and extractable and metals-arsenic, Lead, Cadmium, and beryllium. The lateral and vertical extent of COC'S detected in the soil has been sufficiently defined for purposes of developing the soil, final remedial action objectives.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 10/26/2008
Comments: Filedwork was completed in accordance with project documents.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 06/30/2010
Comments: Not reported

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Certification
Future Due Date: 2015
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: 5 Year Review Reports
Future Due Date: 2020
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: 5 Year Review Reports
Schedule Due Date: 06/30/2015
Schedule Revised Date: Not reported
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: Land Use Restriction
Schedule Due Date: 06/30/2015
Schedule Revised Date: Not reported

Facility ID: 34400010
Status: Active
Status Date: 06/03/1992
Site Code: 100139
Site Type: State Response
Site Type Detailed: State Response or NPL
Acres: 40
NPL: NO
Regulatory Agencies: SMBRP, RWQCB 5R - Central Valley
Lead Agency: SMBRP
Program Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.58557
Longitude: -121.5016
APN: NONE SPECIFIED
Past Use: RAIL ROAD MAINTENANCE SHOP
Potential COC: * HALOGENATED ORGANIC COMPOUNDS Lead
Confirmed COC: * HALOGENATED ORGANIC COMPOUNDS Lead
Potential Description: SOIL
Alias Name: SACRAMENTO RAILYARD FACILITY
Alias Type: Alternate Name
Alias Name: SOUTHERN PACIFIC TRANSPORTATION CO
Alias Type: Alternate Name
Alias Name: SP, SAC - CENTRAL CORRIDOR
Alias Type: Alternate Name
Alias Name: SP-SAC LOCOMOTIVE WORKS
Alias Type: Alternate Name
Alias Name: SP-SAC OVERALL SITE
Alias Type: Alternate Name
Alias Name: UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type: Alternate Name
Alias Name: CAD073772030
Alias Type: EPA Identification Number
Alias Name: 110000609770
Alias Type: EPA (FRS #)
Alias Name: 110012532170
Alias Type: EPA (FRS #)
Alias Name: 110033620295
Alias Type: EPA (FRS #)
Alias Name: T10000001962
Alias Type: GeoTracker Global ID
Alias Name: 100139
Alias Type: Project Code (Site Code)
Alias Name: 34400004
Alias Type: Envirostor ID Number
Alias Name: 34400010
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 02/20/2003
Comments: CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine, and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safely clean up asbestos if found during future soil excavation. A comment period for the project was held from 2/25/03 to 3/27/03. A public meeting was held on 3/11/03. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Date: 04/17/2002
Comments: CEQA - NOD -- The Department approved an Explanation of Significant Differences (ESD) on 4/17/02 to permit soil bioremediation treatment on-site. To meet the requirements of the California Environmental Quality Act, DTSC, in its role as the Lead Agency for the soil remediation of the site, has considered the Environmental Impact Reports prepared for and certified by the City of Sacramento (City). DTSC has determined that the EIRs and supporting documents relied on for approval of the site soil Remedial Action Plans have adequately adddressed the potential impacts of the project proposed under the ESD. DTSC, using its independent judgement has determined that the project, in its approved form, will not result in a significant adverse effect on the environment. A Notice of Determination indicating the results of said findings has been filed with the State Clearninghouse of the Governor's Office of Planning and Research pursuant to Section 15096(i) of the State CEQA Guidelines.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 02/16/2000
Comments: CEQA/NOD - The DTSC approved the Notice of Determination for the LSA Final Amended RAP(FARAP), and the NSSA, CSNSA, and CCSA Final Remedial Action Plan (FRAP) on February 16, 2000.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 07/29/2004
Comments: DES/RDIP -- DESIGN/REMEDIAL DESIGN IMPLEMENTATION PLAN. THE CAR SHOP NINE STUDY AREA (CSSA) IS APPROXIMATELY 35 ACRES OF THE 240 ACRE FORMER SPTCO RAIL YARD LOCATED IN DOWNTOWN SACRAMENTO. THE CSSA WAS UTILIZED FOR BOXCAR CLEANING DISMANTLING AND SANDBLASTING. A SAWMILL WAS UTILIZED FOR LUMBER MILLING, PLAINING, AND WOODWORKING. THE RDIP 2004 PROVIDES FOR EXCAVATION, STORAGE, TREATMENT, AND OFFSITE DISPOSAL OF APPROXIMATELY 120,000 CUBIC YARDS OF SOIL CONTAMINATED WITH VOLATILE ORGANIC COMPOUNDS (VOCs), SVOC, AND TOTAL PETROLEUM HYDROCARBON (TPH) IN THE CENTRAL CORRIDOR STUDY AREA, CAR SHOP NINE STUDY AREA, AND LAGOON STUDY AREA FOR WHICH REMEDIAL ACTION PLANS (RAPs) HAVE BEEN PREVIOUSLY APPROVED.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 05/08/2003
Comments: RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safety clean up of asbestos if found during future soil excavation. In compliance with CEQA, DTSC has prepared a notice of exemption. A comment period for the project was held from February 25 through March 27, 2003. A public meeting was held on March 11, 2003. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: PROJECT WIDE

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 04/17/2002
Comments: RAP - ESD -- The Department has approved an Explanation of Significant Differences (ESD) on 4/17/02 to permit soil bioremediation treatment on-site. Soil remediation strategies approved under the site Remedial Action Plans (RAP) includes excavation of impacted soil, treating certain soil prior to reuse or disposal, and loading all waste soil for off-site disposal to a landfill. Treatment options approved under the RAP did not specifically include bioremediation of soil. The enclosed ESD has been prepared to amend the site RAP administrative record to include bioremediation treatment of stockpiled soil containing petroleum hydrocarbon. The proposed change is protective of human health and the environment, complies with appropriate, applicable or relevant federal and state requirements and remains cost-effective.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 01/30/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 05/22/2000
Comments: DES - The DTSC approved the Final Remediation Design and Implementation Report (RDIP) on May 22, 2000, for the Central Corridor Study Area, 29 acres of the 240 acre SPTCo - Sacramento Rail Yard Site. The approved RDIP for remediation for the 98,888 cubic yards of contaminated soils consists of excavation, land farming, chemical stabilization and, off-site disposal. Implementation of the RDIP is scheduled to begin in May of 2000, and to continue through October of 2005. The preliminary costs of the proposed alternative is estimated to be 5,998,757.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 02/16/2000
Comments: RAP - The DTSC approved the Final RAP for the Central Corridor Study Area which consists of 29 acres of the 240 acre Southern Pacific Transportation- Sacramento Rail Yard Site. The approved alternative for remediation for the 98,888 cubic yards of contaminated soils identified in the RAP is excavation, land farming, chemical stabilization and off-site disposal. Implementation of the selected alternative is scheduled to begin in May of 2000 and to continue through October of 2005. The preliminary cost of proposed alternative is estimated to be $5,998,757.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 10/05/1998
Comments: RI/FS - The Union Pacific Railroad Company has completed soil characterization of the former Southern Pacific Transportation

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Company - Sacramento Railyard, Central Corridor Study Area (CCSA). Groundwater contamination for the CCSA will be addressed within the Lagoon groundwater and Central Shops/South Plume Remedial Investigation/Feasibility Study (RI/FS) and Remedial Action Plan (RAP). The CCSA was utilized for boxcar cleaning and dismantiling, sandblasting, general offices, and a sawmill. Additionally, four underground storage tanks (USTs) were located at the CCSA. During Phase 1 Characterization, soil gas samples were collected from 69 locations, 22 soil borings were drilled and sampled, and groundwater samples were collected from 12 locations. During Phase II, the final phase, 19 additional soil borings were drilled. Compunds of concern (COC's) detected in the soil included volatile organic compounds (VOCs) - vinyl chloride (VC) and Trichloroethylene (TCE), Semi-volatile organic compounds (SVOCs)- Polynuclear Aromatics (PNAs), anthracene and chrysene, Total petroleum hydrocarbons TPH-#2 and #6 fuel oil, oi and grease and extractable, and metal-arsenic, lead, cadmium, and beryllium. The lateral and vertical extent of COCs detected in the soil has been sufficiently defined for purposes of developing the soil, final remedial action objectives.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 10/26/2008
Comments: Fielwork was performed in accordance with project documents.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 06/30/2010
Comments: Not reported

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Certification
Future Due Date: 2015
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: 5 Year Review Reports
Schedule Due Date: 06/30/2015
Schedule Revised Date: Not reported
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: Land Use Restriction
Schedule Due Date: 06/30/2015
Schedule Revised Date: Not reported

Facility ID: 34400011
Status: Active
Status Date: 02/09/1995
Site Code: 100552
Site Type: Voluntary Cleanup
Site Type Detailed: Voluntary Cleanup
Acres: 240
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Program Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Voluntary Cleanup Program
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.58448
Longitude: -121.5010
APN: 00200100440000
Past Use: RAIL ROAD MAINTENANCE SHOP
Potential COC: Lead Polynuclear aromatic hydrocarbons (PAHs TPH-diesel TPH-gas TPH-MOTOR OIL Trichloroethylene (TCE Vinyl chloride
Confirmed COC: Lead Polynuclear aromatic hydrocarbons (PAHs TPH-diesel TPH-gas Trichloroethylene (TCE Vinyl chloride TPH-MOTOR OIL
Potential Description: SOIL
Alias Name: SOUTHERN PACIFIC TRANSPORTATION CO.
Alias Type: Alternate Name
Alias Name: SP, SAC - REDEVELOPMENT
Alias Type: Alternate Name
Alias Name: 00200100440000
Alias Type: APN
Alias Name: CAD073772030
Alias Type: EPA Identification Number
Alias Name: 110012532170
Alias Type: EPA (FRS #)
Alias Name: 110033620295
Alias Type: EPA (FRS #)
Alias Name: SL205072992
Alias Type: GeoTracker Global ID
Alias Name: 100552
Alias Type: Project Code (Site Code)
Alias Name: 34400011
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Memorandum of Agreement - IAG
Completed Date: 02/22/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 02/22/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 10/12/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Document Type:	Other Report
Completed Date:	07/31/2000
Comments:	2000 Environmental Oversight Program

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Deed/LUR Enforcement & Implementation Plan
Completed Date:	12/13/1994
Comments:	1994 Memorandum of Understanding

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Voluntary Cleanup Agreement
Completed Date:	01/05/1995
Comments:	The City of Sacramento, SPT Co, and the DTSC signed a Memorandum of Understanding (MOU) concerning remediation and redevelopment of the Sacramento Locomotive Works, Sacramento, California. The MOU was implemented to enable orderly and timely remediation and redevelopment of the railyards in a manner fully protective of human health and the environment.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Correspondence
Completed Date:	04/18/2008
Comments:	Not reported

Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

Facility ID:	34400004
Status:	Active
Status Date:	01/01/1983
Site Code:	100139
Site Type:	State Response
Site Type Detailed:	State Response or NPL
Acres:	31
NPL:	NO
Regulatory Agencies:	SMBRP, RWQCB 5R - Central Valley
Lead Agency:	SMBRP
Program Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	* RCRA 3012 - Past Haz Waste Disp Inven Site
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Responsible Party
Latitude:	38.58585

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Longitude: -121.5016
APN: 00200100440000
Past Use: RAIL ROAD MAINTENANCE SHOP, RAILROAD RIGHT OF WAY
Potential COC: * OIL/WATER SEPARATION SLUDGE * DETERGENT & SOAP * ACID SOLUTION 2>PH WITH METALS * ALKALINE SOLUTION WITHOUT METALS Asbestos Containing Materials (ACM * Sludge - Paint * UNSPECIFIED ACID SOLUTION * UNSPECIFIED AQUEOUS SOLUTION * UNSPECIFIED OIL CONTAINING WASTE * UNSPECIFIED SOLVENT MIXTURES * OTHER INORGANIC SOLID WASTE Benzene Polynuclear aromatic hydrocarbons (PAHs Tetrachloroethylene (PCE TPH-diesel TPH-gas TPH-MOTOR OIL 1,1,1-Trichloroethane (TCA Trichloroethylene (TCE Vinyl chloride Acetone Ethylbenzene Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene Toluene Xylenes
Confirmed COC: * OTHER INORGANIC SOLID WASTE * Sludge - Paint * UNSPECIFIED ACID SOLUTION * UNSPECIFIED AQUEOUS SOLUTION * UNSPECIFIED OIL CONTAINING WASTE * UNSPECIFIED SOLVENT MIXTURES Benzene * OIL/WATER SEPARATION SLUDGE * DETERGENT & SOAP * ACID SOLUTION 2>PH WITH METALS * ALKALINE SOLUTION WITHOUT METALS Asbestos Containing Materials (ACM Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene Polynuclear aromatic hydrocarbons (PAHs Tetrachloroethylene (PCE TPH-diesel TPH-gas 1,1,1-Trichloroethane (TCA Trichloroethylene (TCE Vinyl chloride Acetone Ethylbenzene Toluene TPH-MOTOR OIL Xylenes
Potential Description: AQUI, OTH, SOIL, SV, IA
Alias Name: SACRAMENTO RAILYARD FACILITY
Alias Type: Alternate Name
Alias Name: SOUTHERN PACIFIC
Alias Type: Alternate Name
Alias Name: SOUTHERN PACIFIC TRANSPORTATION CO
Alias Type: Alternate Name
Alias Name: SP, SAC - CENTRAL SHOP
Alias Type: Alternate Name
Alias Name: SP-SAC - LOCOMOTIVE WORKS
Alias Type: Alternate Name
Alias Name: SP-SAC - OVERALL SITE
Alias Type: Alternate Name
Alias Name: Sac Railyard
Alias Type: Alternate Name
Alias Name: UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type: Alternate Name
Alias Name: 00200100440000
Alias Type: APN
Alias Name: CAD073772030
Alias Type: EPA Identification Number
Alias Name: 110000609770
Alias Type: EPA (FRS #)
Alias Name: 110012532170
Alias Type: EPA (FRS #)
Alias Name: 110033620295
Alias Type: EPA (FRS #)
Alias Name: T10000001832
Alias Type: GeoTracker Global ID
Alias Name: P11077

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Alias Type: PCode
Alias Name: 100139
Alias Type: Project Code (Site Code)
Alias Name: 34320031
Alias Type: Envirostor ID Number
Alias Name: 34360065
Alias Type: Envirostor ID Number
Alias Name: 34400004
Alias Type: Envirostor ID Number
Alias Name: 34400006
Alias Type: Envirostor ID Number
Alias Name: 34400008
Alias Type: Envirostor ID Number
Alias Name: 34400009
Alias Type: Envirostor ID Number
Alias Name: 34400010
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 02/21/2003
Comments: DTSC approved RAW for soil cleanup of six acres of the Central Shops Study area along a new rail line corridor prior to moving the frieght track. The RAW proposes excavation of soil impacted with SVOCs, VOCs and metals and implementation will be consistent with RDIP approved for soil remediation activities.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Design - Preliminary/Intermediate
Completed Date: 06/27/2014
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 07/03/2013
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Feasibility Study Report
Completed Date: 06/30/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 08/08/1995
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 05/12/1995
Comments: Offsite Groundwater RA Completed

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 04/27/1995
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 03/08/1993
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 02/28/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment Report
Completed Date: 02/09/1987
Comments: Site Screening is completed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Site Inspection (SI) Report
Completed Date: 08/27/1986
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 05/11/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operations and Maintenance Report
Completed Date: 10/07/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operations and Maintenance Report
Completed Date: 10/07/2010
Comments: Not reported

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 06/01/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Date: 05/31/2011
Comments: RWQCB shared draft letter with DTSC on 5/9/2011. DTSC GSU had no comments on 5/31/2011. RWQCB sent final letter to RP on 5/31/2011.

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 07/26/2011
Comments: Not reported

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 02/03/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 08/30/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 08/18/2011
Comments: Not reported

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Workplan
Completed Date: 01/19/2012
Comments: Not reported

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Well Installation Workplan
Completed Date: 03/12/2012
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 03/09/2012
Comments: Not reported

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 07/22/2013
Comments: Approved workplan except for dye, and with condition to work with NA tribe.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 05/07/2003

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Comments:	DTSC prepared a notice of determination (NOD) for Removal Action Workplan (RAW) for soil cleanup in six acres of the Central Shops Study Area of the Rail Yard. This plan would result in soil cleanup along a proposed new rail line corridor prior to moving the freight track. A comment period for the project was held from February 25 through March 27, 2003. A public meeting was held on March 11, 2003. Public comment were received by DTSC and addressed through a responsiveness summary.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	CEQA - Initial Study/ Environmental Impact Report
Completed Date:	04/27/1995
Comments:	California Environmental Quality Act (CEQA) Ground Water Removal Action (GWRA) -- The DTSC has approved the final California CEQA package for vertical and horizontal containment of an off-site groundwater plume emanating from the SPTCo-Sacramento Rail Yard off-site to the south, the South Plume. The CEQA package project is implementation of two Interim Remedial Measures (IRMs), the South Plume Source Control and the South Plume Margin Control. The South Plume Margin Control consists of a groundwater extraction system located on P Street in Sacramento for leading edge capture. The South Plume Source Control consists of a groundwater/soil vapor extraction and treatment system located within the SPTCo-Sacramento Rail Yard to capture identified sources. Removal Action Work Plan (RAW) Groundwater Removal Action (GWRA) -- A Removal Action Workplan was approved for two South Plume Margin Control. The South Plume Margin Control consists of a groundwater extraction system located on P Street in Sacramento. The South Plume Source Control is comprised of a groundwater/soil vapor extraction and treatment system located within the Central Shops Study area of the SPTCo-Sacramento Rail Yard. The Interim Remedial Measures (IRMs) are being implemented to control the lateral and veritcal migration of groundwater contaminated with volatile organic compounds. The groundwater extraction system became operational on May 12, 2001.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Consent Order
Completed Date:	06/02/1988
Comments:	Enforceable Agreement dated June 2, 1988
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	* Discovery
Completed Date:	01/07/1980
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Correspondence
Completed Date:	03/20/2013
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Assessment Report

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Date:	03/01/1984
Comments:	Preliminary Assessment: Central Valley RWQCB (12/17/81) - operations are locomotive maintenance, engine building/ rebuilding, forging, metal painting, battery machining, wheel brake, & fabrication. In operation since 1863. 100-year flood plain.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Removal Action Completion Report
Completed Date:	07/01/2005
Comments:	DTSC approved the "Completion of Soil Remediation in 4.25 acre Main Freight Line Relocation within the Central Shops Area" on July 1, 2005. The RWQCB provided concurrence on July 8, 2005.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Risk Assessment Report
Completed Date:	12/01/2005
Comments:	RP submitted inserts to the Draft HRA Report to update the conclusions to address DTSC's request for an indoor air evaluation. Conclusions were updated to indicate although no unacceptable risks are associated with the Central Shops and South Plume ground water under current conditions and land use, potential unacceptable risks may be associated with future land use, thus further evaluation with repect to soil and groundwater is required. This additional evaluation will be included in the Feasibility Study as part of the development of remedial goals for soil and groundwater. The future evaluation of VOCs will include all applicable exposure pathways including indoor air.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Fact Sheets
Completed Date:	02/01/2003
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Public Notice
Completed Date:	02/01/2003
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Investigation Report
Completed Date:	10/01/2002
Comments:	Final.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Action Implementation Workplan
Completed Date:	02/01/2003
Comments:	Asbestos Contingency Plan
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Removal Action Workplan

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Date: 10/08/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Well Installation Workplan
Completed Date: 11/19/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Feasibility Study Workplan
Completed Date: 09/17/2008
Comments: Not reported

Completed Area Name: Sacramento County Garage
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 06/28/2011
Comments: RWQCB issued order and is overseeing necessary followup wtih the County Garage.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Implementation Workplan
Completed Date: 11/20/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Workplan
Completed Date: 04/19/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fact Sheets
Completed Date: 02/19/2013
Comments: Fact Sheet uploaded for the Central Shops and South Plume RAP

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Notice
Completed Date: 02/19/2013
Comments: Central Shops and South Plume RAP Public Notice.

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Workplan
Completed Date: 07/22/2013
Comments: Approval of workplan with exception of fluorescing dye tracer. Must coordinate with United Auburn Indian Community of the Auburn Rancheria per February 14, 2013 meeting.

Completed Area Name: South Plume (Groundwater)
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Design - Preliminary/Intermediate

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Date:	07/21/2014
Comments:	Not reported
Completed Area Name:	South Plume (Groundwater)
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Design - Preliminary/Intermediate
Completed Date:	01/13/2014
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Fieldwork
Completed Date:	06/30/2014
Comments:	Fieldwork completed. Several visits by Ruth, Cindy, Jerod, and RWQCB Brad.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Design - Preliminary/Intermediate
Completed Date:	01/13/2014
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Design - Preliminary/Intermediate
Completed Date:	01/13/2014
Comments:	Not reported
Completed Area Name:	South Plume (Groundwater)
Completed Sub Area Name:	Not reported
Completed Document Type:	Work Notice
Completed Date:	05/09/2014
Comments:	Work notice was finalized and distributed by UPRR/ERM to local businesses.
Completed Area Name:	South Plume (Groundwater)
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Design - Preliminary/Intermediate
Completed Date:	11/06/2014
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Design - Preliminary/Intermediate
Completed Date:	01/30/2015
Comments:	Workplan submitted 12/12/14. Comments issued 1/30/2015. Response to comments received 2/6/15 and considered adequate.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	CEQA - Responsible Agency Review
Completed Date:	07/03/2013
Comments:	See: 7/3/2013 "Remedial Action Plan (Central Shops - Soil and South Plume - GW)". Link: http://www.envirostor.dtsc.ca.gov/screens/menu.asp?global_id=34400004&table_name=COMPLIANCE_MANAGER&mycmd=viewdoc&doc_id=5005828

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 02/16/2000
Comments: Notice of Determination

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Remedial Action Completion Report
Future Due Date: 2017
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

Facility ID: 34320031
Status: Certified
Status Date: 06/22/1990
Site Code: 100139
Site Type: State Response
Site Type Detailed: State Response or NPL
Acres: Not reported
NPL: NO
Regulatory Agencies: HWMP, SMBRP, RWQCB 5R - Central Valley
Lead Agency: NONE SPECIFIED
Program Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.58553
Longitude: -121.5018
APN: 00200100440000
Past Use: RAIL ROAD MAINTENANCE SHOP, SAND BLASTING
Potential COC: Lead
Confirmed COC: Lead
Potential Description: SOIL
Alias Name: SOUTHERN PACIFIC TRANSPORTATION CO
Alias Type: Alternate Name
Alias Name: SP, SAC - SAND PILES
Alias Type: Alternate Name
Alias Name: 00200100440000
Alias Type: APN
Alias Name: 110000609770
Alias Type: EPA (FRS #)
Alias Name: 110033620295
Alias Type: EPA (FRS #)
Alias Name: T10000001980
Alias Type: GeoTracker Global ID
Alias Name: 100139
Alias Type: Project Code (Site Code)
Alias Name: 34320031

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Alias Type: Envirostor ID Number
Alias Name: 34400004
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 11/24/1989
Comments: Remedial action completed. The material was segregated. The majority was recycled in the production of asphalt. Some material was disposed of at a Class I landfill. Concrete, wood, and metal debris were taken to a Class III landfill. 2,341 tons were recycled, 1,169 tons were removed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 06/22/1990
Comments: Certified. DHS cleanup goal of 950 mg of lead/kg of soil was met.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

Facility ID: 34360065
Status: Certified O&M - Land Use Restrictions Only
Status Date: 10/04/2010
Site Code: 100139
Site Type: State Response
Site Type Detailed: State Response or NPL
Acres: 1
NPL: NO
Regulatory Agencies: HWMP, SMBRP, RWQCB 5R - Central Valley
Lead Agency: NONE SPECIFIED
Program Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: YES
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.58869
Longitude: -121.5014
APN: 00200100440000
Past Use: BATTERY STORAGE
Potential COC: * CONTAMINATED SOIL * ACID SOLUTION 2>PH WITH METALS Lead Nickel
Confirmed COC: NONE SPECIFIED
Potential Description: SOIL
Alias Name: SACRAMENTO RAILYARD FACILITY

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC TRANSPORTATION COMPANY
Alias Type:	Alternate Name
Alias Name:	SP, SAC - BATTERY SHOP YARD
Alias Type:	Alternate Name
Alias Name:	SP-SAC - BATTERY SHOP
Alias Type:	Alternate Name
Alias Name:	SP-SAC - LOCOMOTIVE WORKS
Alias Type:	Alternate Name
Alias Name:	SP-SAC - OVERALL SITE
Alias Type:	Alternate Name
Alias Name:	UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type:	Alternate Name
Alias Name:	00200100440000
Alias Type:	APN
Alias Name:	CAD073772030
Alias Type:	EPA Identification Number
Alias Name:	110000609770
Alias Type:	EPA (FRS #)
Alias Name:	110012532170
Alias Type:	EPA (FRS #)
Alias Name:	110033620295
Alias Type:	EPA (FRS #)
Alias Name:	T10000001959
Alias Type:	GeoTracker Global ID
Alias Name:	100227
Alias Type:	Site Code - Historical
Alias Name:	100139
Alias Type:	Project Code (Site Code)
Alias Name:	34360065
Alias Type:	Envirostor ID Number
Alias Name:	34400004
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	5 Year Review Reports
Completed Date:	04/09/1998
Comments:	5YEAR -- THE 5-YEAR REVIEW FOR THE SOUTHERN PACIFIC TRANSPORTATION COMPANY, SACRAMENTO (SPTCO) BATTERY SHOPS STUDY AREA (BSSA) HAS BEEN REVIEWED AND APPROVED BY THE DEPARTMENT. THE REPORT WAS COMPLETED AS A TYPE IA REVIEW, AS RECOMMENDED BY DTSC AND CONSISTENT WITH OSWER DIRECTIVE 9355.7-02A. THE IA REVIEWS ARE APPLICABLE FOR SITES WHERE CLOSURE IS NOT COMPLETE AND NO SPECIAL CIRCUMSTANCES HAVE ARISEN SINCE THE REMEDIAL ACTION WAS PERFORMED THE BSSA SOILS WERE EXCAVATED AND DISPOSED OF OFFSITE TO REMEDIAT LEAD, CHROMIUM, AND ARSENIC SOIL CONTAMINATION FROM DISPOSAL OF SPENT BATTERY ACID INTO ONSITE DRY WELLS. AS PART OF THE APRIL 1990 FINAL REMEDIAL ACTION PLAN FOR BSSA, SPTCO WAS REQUIRED TO INSTALL AND MONITOR 5 GROUNDWATER MONITORING WELLS IN THE UPPER SAND ZONE TO EVALUATE THE POTENTIAL SOIL CONTAMINATION FROM THE BSSA IMPACTING GROUNDWATER. BASED ON THE REVIEW OF THE GROUND WATER MONITORING DATA, THE REMEDIATION PERFORMED FOR THE BSSA IS MEETING THE OBJECTIVE OF THE BSSA RAP/CP.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Action Completion Report

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Date: 06/25/1990
Comments: The DTSC approved the Closure Report for the Former Battery Shop Yard, Sacramento Locomotive Works dated June 18, 1990

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 04/26/1990
Comments: The Final RAP /Closure Plan (RAP/CP) for the Battery Shops has been adopted and DTSC determined the that the RAP/COP satisfactorily addresses all applicable state and federal statutes and regulations.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/09/2010
Comments: Issued response on 11/9/2010.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/19/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/29/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 06/02/1988
Comments: DHS gives Remedial Action Order.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 06/28/1990
Comments: The deed restriction allows all uses of the property, although if the property is to be used for residential or educational purposes at ground level or the public as unimproved land (eg., park, open space, gardening), the owners and occupants shall take action so that public is not exposed to concentrations of lead greater than 174 mg/kg (or other standard determined by the Department to be protective of public health and the environment). The deed restriction limits excavation and disposal of soil without Department approval, and does not allow disturbance of the 2-foot clean soil cap.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 06/25/1990
Comments: Certified. Excavation and disposal of 262 tons of soil at class I landfill. Cleanup level of 950 mg of lead/kg soil was met.

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: 5 Year Review Reports
Future Due Date: 2020
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: 5 Year Review Reports
Schedule Due Date: 06/30/2015
Schedule Revised Date: Not reported

Facility ID: 60001652
Status: Active
Status Date: 03/01/2012
Site Code: 102186
Site Type: Voluntary Cleanup
Site Type Detailed: Voluntary Cleanup
Acres: 240
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Voluntary Cleanup Program
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.58712
Longitude: -121.4998
APN: NONE SPECIFIED
Past Use: RAIL ROAD MAINTENANCE SHOP, RAILROAD RIGHT OF WAY
Potential COC: Arsenic Lead TPH-diesel TPH-MOTOR OIL
Confirmed COC: Arsenic Lead TPH-diesel TPH-MOTOR OIL
Potential Description: SOIL, SV
Alias Name: 102186
Alias Type: Project Code (Site Code)
Alias Name: 60001652
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 11/01/2012
Comments: Resolved. No documents submitted. Inland entered into a cost recovery agreement with DTSC to continue with biweekly consultation meetings.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consultative Service Agreement
Completed Date: 06/24/2014
Comments: DTSC letter sent to IAH on 6/24/2014. Agreement for DTSC oversight scope of work and reimbursement.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Document Type:	Consultative Service Agreement
Completed Date:	06/26/2014
Comments:	Amendment to change end date. Agreement for DTSC oversight scope of work and reimbursement.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Consultative Service Agreement
Completed Date:	07/24/2012
Comments:	DGS executed agreement on 7/20/2012. DTSC letter sent to IAH on 7/24/2012.
Future Area Name:	PROJECT WIDE
Future Sub Area Name:	Not reported
Future Document Type:	Land Use Restriction
Future Due Date:	2015
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

Facility ID:	34400005
Status:	Certified / Operation & Maintenance
Status Date:	01/12/1996
Site Code:	100139
Site Type:	State Response
Site Type Detailed:	State Response or NPL
Acres:	2
NPL:	NO
Regulatory Agencies:	HWMP, SMBRP, RWQCB 5R - Central Valley
Lead Agency:	NONE SPECIFIED
Program Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	* RCRA 3012 - Past Haz Waste Disp Inven Site
Restricted Use:	YES
Site Mgmt Req:	NONE SPECIFIED
Funding:	Responsible Party
Latitude:	38.58849
Longitude:	-121.4994
APN:	NONE SPECIFIED
Past Use:	RAIL ROAD MAINTENANCE SHOP, WASTE WATER PONDS
Potential COC:	* HALOGENATED ORGANIC COMPOUNDS * OIL/WATER SEPARATION SLUDGE * CONTAMINATED SOIL * UNSPECIFIED OIL CONTAINING WASTE * WASTE OIL & MIXED OIL Arsenic Benzene Lead Tetrachloroethylene (PCE TPH-diesel TPH-gas TPH-MOTOR OIL Trichloroethylene (TCE Acetone Dibromochloromethane 1,2-Dibromo-3-chloropropane (DBCP 1,1-Dichloroethane 1,2-Dichloroethane (EDC 1,1-Dichloroethylene 1,2-Dichloroethylene (cis 1,2-Dichloroethylene (trans 4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB) 2,4-Dichlorophenoxyacetic Acid (2,4-D 1,2-Dichloropropane 1,3-Dichloropropane 1,3-Dichloropropene 2,3-Dichloropropanol Ethyl acrylate Polynuclear aromatic hydrocarbons (PAHs 1,1,1,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane Toluene

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

1,2,4-Trichlorobenzene 1,1,2-Trichloroethane Xylenes
Confirmed COC: 10196-NO 10199-NO 30001-NO 30003-NO 10002-NO 30013-NO 10060-NO 10097-NO 30472-NO 30535-NO 30536-NO 30563-NO 30564-NO 30022-NO 30024-NO 30025-NO 30027-NO 30032-NO 30180-NO 30181-NO 30192-NO 30193-NO 30194-NO 30195-NO 30196-NO 30198-NO 30199-NO 30200-NO 30201-NO 30202-NO 30203-NO 30271-NO 30550-NO 3002502-NO 30593-NO
Potential Description: AQUI, SOIL
Alias Name: SACRAMENTO RAILYARD FACILITY
Alias Type: Alternate Name
Alias Name: SOUTHERN PACIFIC
Alias Type: Alternate Name
Alias Name: SOUTHERN PACIFIC TRANSPORTATION CO
Alias Type: Alternate Name
Alias Name: SP, SAC - PONDS AND DITCH
Alias Type: Alternate Name
Alias Name: SP-SAC - LOCOMOTIVE WORKS
Alias Type: Alternate Name
Alias Name: SP-SAC - OVERALL SITE
Alias Type: Alternate Name
Alias Name: SP-SAC - PONDS AND DITCH
Alias Type: Alternate Name
Alias Name: UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type: Alternate Name
Alias Name: CAD073772030
Alias Type: EPA Identification Number
Alias Name: 110000609770
Alias Type: EPA (FRS #)
Alias Name: 110012532170
Alias Type: EPA (FRS #)
Alias Name: 110033620295
Alias Type: EPA (FRS #)
Alias Name: T10000001977
Alias Type: GeoTracker Global ID
Alias Name: P14029
Alias Type: PCode
Alias Name: 100139
Alias Type: Project Code (Site Code)
Alias Name: 34400004
Alias Type: Envirostor ID Number
Alias Name: 34400005
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/19/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/29/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Date: 04/28/1995
Comments: RMDL (GW2) -- The Ponds and Ditch Study Area (PDSA) groundwater extraction system has been modified and implemented to meet the requirements of the Remedial Action Plan and Closure Plan (RAP) for the Southern Pacific Transportation Company-Sacramento, Rail Yard PDSA. The original five well extraction system selected as the remedial alternative was modified to be a seven well extraction and treatment system after total Volatile Organic Compound (VOC) discharge levels exceeded the 100 parts per billion (ppb) total VOC level required for extraction and discharge into the Sacramento City sewer system. An original groundwater extraction well, exw-4, was identified as the primary source of VOC's. To address this, SPTCo installed two additional groundwater extraction wells, exw-6 and exw-7, and connected exw-4, exw-6 and exw-7 to the existing Drum Storage Area soil vapor/groundwater extraction system for treatment prior to discharge. The original PDSA groundwater extraction system was in operation on November 5, 1992. The complete, modified groundwater extraction system has been in operation since Aug. 15, 1994.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operations and Maintenance Plan
Completed Date: 06/30/1994
Comments: ORDER -- the Department, after extensive efforts to negotiate an agreement with SPTCo, issued an Order to SPTCo for Operation and Maintenance of a groundwater extraction system at the Pond and Ditch site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 06/23/1994
Comments: DESIGN -- the Department approved SPTCo's Modified Pond & Ditch Extraction system: Final Design Report. The Final Design Report provides detailed plumbing and electrical plans and provides discharge requirements from the City of Sacramento and treatment requirements from the County of Sacramento.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Report
Completed Date: 01/05/1994
Comments: RI/FS -- FOURTEEN GROUND WATER SAMPLES WERE COLLECTED DOWN GRADIENT, AT THE ESTIMATED MARGIN OF THE UPPER SAND ZONE GROUNDWATER PLUME. RESULTS FROM THE SAMPLING INDICATE THAT THE PLUME MARGIN IS WITHIN THE ESTIMATED MARGIN, COMPLETING CHARACTERIZATION AND ALLOWING TREATMENT BY THE EXISTING, MODIFIED GROUND WATER EXTRACTION SYSTEM. APPROX. COST OF THIS SAMPLING WAS $50,000 WHICH WAS PAID FOR BY THE RP.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 05/30/1993
Comments: FRA (SOIL) -- This final remedial action consisted of back- filling and compaction of an excavation with 11,000 cubic yards of imported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

clean fill and was completed May 30, 1993. In order to meet the RCRA Closure requirements for this unit, prior to backfilling an area of excavation, a post- remediation health risk assessment was required. The recently approved assessment has shown the site will not pose unacceptable risks, therefore allowing backfill of the excavation. Approx cost = $110,000 (RP funded)

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedy Constructed: Operating Properly & Successfully
Completed Date: 10/29/1992
Comments: FRA (GW1) -- A 5-well ground water extraction system was started up at the site. The system initially withdrew 250 gpm of water impacted by chlorinated solvents. The system evaluation conducted since the start-up has shown that augmentation will be required with at least two additional extraction wells and predischarge treatment to reduce contaminant concentrations to levels acceptable for discharge to the city of Sacramento sewer system for treatment at the publicly owned treatment works. Approx. 110,000,000 gallons pumped & treated this FY. Approx. cost = $250,000 (RP funded)

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 06/27/1991
Comments: OIL POND REMOVAL

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 06/20/1991
Comments: APPROXIMATELY 1880 CUBIC YARDS OF SOIL WAS EXCAVATED AND DISPOSED

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 03/30/1990
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 06/30/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 02/28/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 12/31/1987
Comments: Not reported

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Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 07/31/1985
Comments: Removal Action: Pond - soil/sludge removal.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/09/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 05/07/2003
Comments: CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine, and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safely clean up asbestos if found during future soil excavation. A comment period for the project was held from 2/25/03 to 3/27/03. A public meeting was held on 3/11/03. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 01/12/1996
Comments: Wastewater disposal pond/ditch. Contaminants include Pb, toluene, TCE, PCE, 1,1-DCA, xylene, benzene, 1,1,1-TCA, and PAH. Groundwater contaminated with Ni, TCE, Cr, 1,2-DCE, and methylene chloride.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 05/19/1994
Comments: The deed restriction indicates that the property can be used without restriction for: 1) industrial and commercial and 2) the landscaped and paved areas ancillary to the industrial, commercial or office structures that are covered with 2 feet of clean soil, if not used for play areas. Restricted uses include 1) excavation for any purpose other than remediation 2) residential, 3) public or institutional uses 4) educational 5) day care 6) parks, playgrounds water features, open space, yards, gardens and landscaped areas. Soil must be managed as approved by the Department and infrastructure improvements must be developed consistent with the Deed restriction. In the industrial or commercial use areas, where exposure to soils is possible, such as landscaped area or easements, the owner shall continually keep and maintain clean soil to such depth as the owner or occupant has demonstrated to the reasonable satisfaction of the Department to be protective of human health and the environment. If additional contamination is found during development, adequate measures must be taken to achieve permanent remediation and prevent unacceptable exposure to humans or the environment. The soil disposal shall be managed in accordance with all applicable state and federal laws. No

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

water from below the surface shall be extracted or utilized in any way or consumed, although access will be allowed for groundwater monitoring and extraction systems for Union Pacific, it successors or agents, and the Department for monitoring, inspection, and other activities.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 07/28/1987
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 04/19/1984
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 05/07/2003
Comments: RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safety clean up of asbestos if found during future soil excavation. In compliance with CEQA, DTSC has prepared a notice of exemption. A comment period for the project was held from February 25 through March 27, 2003. A public meeting was held on March 11, 2003. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Amendment - Order/Agreement
Completed Date: 03/10/2000
Comments: The Department issued a conditional approval for modification of the abandonment procedures for water supply well WSW-5 and abandonment of selcted monitoring and extraction wells and shutdown of the Drum Storage Area and Ponds and Ditch Study Area RCRA Unit groundwater treatment systems. The Drum Storage Area and Ponds and Ditch Study Area RCRA Units are to be incorporated into the CERCLA Study areas (Northern Shops Study Area for Former Drum Storage Area and Lagoon Study Area of Ponds and Ditch), although will maintain its unique RCRA identity as subsections in future CERCLA monitoring, letters and reports.

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: 5 Year Review Reports
Future Due Date: 2020
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: 5 Year Review Reports
Schedule Due Date: 06/30/2015
Schedule Revised Date: Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Facility ID:	34400006
Status:	Certified O&M - Land Use Restrictions Only
Status Date:	11/03/2010
Site Code:	100139
Site Type:	State Response
Site Type Detailed:	State Response or NPL
Acres:	40
NPL:	NO
Regulatory Agencies:	SMBRP, RWQCB 5R - Central Valley
Lead Agency:	NONE SPECIFIED
Program Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	* RCRA 3012 - Past Haz Waste Disp Inven Site
Restricted Use:	YES
Site Mgmt Req:	NONE SPECIFIED
Funding:	Responsible Party
Latitude:	38.58452
Longitude:	-121.5008
APN:	00200100440000
Past Use:	RAILROAD RIGHT OF WAY
Potential COC:	* HALOGENATED ORGANIC COMPOUNDS * CONTAMINATED SOIL * UNSPECIFIED OIL CONTAINING WASTE Lead
Confirmed COC:	NONE SPECIFIED
Potential Description:	SOIL
Alias Name:	SACRAMENTO RAILYARD FACILITY
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC
Alias Type:	Alternate Name
Alias Name:	SOUTHERN PACIFIC TRANSPORTATION CO
Alias Type:	Alternate Name
Alias Name:	SP, SAC - SACRAMENTO STATION
Alias Type:	Alternate Name
Alias Name:	SP-SAC - LOCOMOTIVE WORKS
Alias Type:	Alternate Name
Alias Name:	SP-SAC - OVERALL SITE
Alias Type:	Alternate Name
Alias Name:	UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type:	Alternate Name
Alias Name:	00200100440000
Alias Type:	APN
Alias Name:	CAD073772030
Alias Type:	EPA Identification Number
Alias Name:	110000609770
Alias Type:	EPA (FRS #)
Alias Name:	110012532170
Alias Type:	EPA (FRS #)
Alias Name:	110033620295
Alias Type:	EPA (FRS #)
Alias Name:	T10000001979
Alias Type:	GeoTracker Global ID
Alias Name:	100174
Alias Type:	Site Code - Historical
Alias Name:	P14013
Alias Type:	PCode

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Alias Name: 100139
Alias Type: Project Code (Site Code)
Alias Name: 34400004
Alias Type: Envirostor ID Number
Alias Name: 34400006
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 06/02/1994
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 05/30/1992
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 04/10/1991
Comments: COVER

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 04/10/1991
Comments: SOIL

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 12/30/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 08/30/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 02/28/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/09/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Document Type: *Correspondence - Received
Completed Date: 11/19/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 11/29/2010
Comments: Not reported

Completed Area Name: Mainline Track
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 08/20/2012
Comments: 8/20/2012 approval of 8/8/2012 workplan that revised a 6/15/2012 workplan

Completed Area Name: Lot 41
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 02/27/2013
Comments: 2/27/2013 DTSC Approval of 2/4/2013 Addendum to 1/2/2013 Workplan

Completed Area Name: Lot 41
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 08/29/2013
Comments: Not reported

Completed Area Name: Lot 41
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 01/21/2014
Comments: Lot 41 was remediated to remedial goals. Backfill was approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 05/19/1994
Comments: The deed restriction indicates that the property can be used without restriction for: 1) industrial uses and 2) the landscaped and paved areas ancillary to the industrial, commercial or office structures that are covered with 2 feet of clean soil, if not used for play areas. Restricted uses include 1) excavation for any purpose other than remediation 2) residental, 3) public or institutional uses 4) educational 5) day care 6) parks, playgrounds water features, open space, yards, gardens and landscaped areas. Soil must be managed as approved by the Department and instructure improvements must be developed consistent with the Deed restriction. In the industrial use areas, where exposure to soils is possible, such as landscaped area or easements, the owner shall maintain the 2-foot clean soil cover. If additional contamination is found during development, adequate measures must be taken to acheive permanent remediation and prevent unacceptable exposure to humans or the environment. The soil disposal shall be managed in accordance with all applicable state and federal laws. No water No water from below the surface shall be extracted or utilized in any way or consumed, although access will be allowed for

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

groundwater monitoring and extraction systems for Union Pacific, it successors or agents, and the Department for monitoring, inspection, and other activities.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 06/02/1994
Comments: FRA/DEED/CERT -- the site has been certified for soil remedial activities under the Remedial Action Plan. A Deed Restriction has been recorded which limits land use to commercial and industrial uses. Volume Recycled/Reused: 16,300 cubic yds Volume Disposed: 19,300 cubic yds Total Volume Treated/Stab/Disposed: 35,600 cubic yds # Acres of land returned/released: 37 acres

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 02/02/1989
Comments: AGREEMENT

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 06/02/1988
Comments: Enforceable Agreement

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: 5 Year Review Reports
Future Due Date: 2020
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: 5 Year Review Reports
Schedule Due Date: 06/30/2015
Schedule Revised Date: Not reported

Facility ID: 34400007
Status: Active
Status Date: 01/01/1990
Site Code: 100139
Site Type: State Response
Site Type Detailed: State Response or NPL
Acres: 50
NPL: NO
Regulatory Agencies: SMBRP, RWQCB 5R - Central Valley
Lead Agency: SMBRP
Program Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: * RCRA 3012 - Past Haz Waste Disp Inven Site
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.58653

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Longitude: -121.4998
APN: 00200100440000
Past Use: RAIL ROAD MAINTENANCE SHOP
Potential COC: * HALOGENATED ORGANIC COMPOUNDS * OIL/WATER SEPARATION SLUDGE * ORGANIC LIQUIDS WITH METALS * CONTAMINATED SOIL * UNSPECIFIED OIL CONTAINING WASTE * WASTE OIL & MIXED OIL * ORGANIC LIQUIDS (NONSOLVENTS) WITH HALOGENS Benzene Lead Polynuclear aromatic hydrocarbons (PAHs Tetrachloroethylene (PCE TPH-diesel TPH-JET FUEL TPH-MOTOR OIL 1,1,1-Trichloroethane (TCA Trichloroethylene (TCE Vinyl chloride Acetone 1,1-Dichloroethane 1,1-Dichloroethylene 1,2-Dichloroethylene (cis 1,2-Dichloroethylene (trans Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene Toluene Xylenes
Confirmed COC: * ORGANIC LIQUIDS (NONSOLVENTS) WITH HALOGENS * UNSPECIFIED OIL CONTAINING WASTE * WASTE OIL & MIXED OIL Benzene * HALOGENATED ORGANIC COMPOUNDS Lead * OIL/WATER SEPARATION SLUDGE * ORGANIC LIQUIDS WITH METALS 10097-NO 30472-NO 30473-NO 30474-NO 30475-NO 30476-NO 30477-NO 30478-NO 30479-NO 30480-NO 30481-NO 30482-NO 30483-NO 30484-NO 30485-NO 30019-NO 30022-NO 30024-NO 30026-NO 30027-NO 30028-NO 30032-NO 30192-NO 30194-NO 30195-NO 30196-NO 30550-NO 3002501-NO 3002502-NO 30593-NO
Potential Description: SOIL
Alias Name: SACRAMENTO RAILYARD FACILITY
Alias Type: Alternate Name
Alias Name: SOUTHERN PACIFIC TRANSPORTATION CO
Alias Type: Alternate Name
Alias Name: SP, SAC - NORTHERN SHOPS
Alias Type: Alternate Name
Alias Name: SP, SAC - NORTHERN SHOPS/DRUM STORAGE
Alias Type: Alternate Name
Alias Name: SP-SAC - DRUM STORAGE AREA
Alias Type: Alternate Name
Alias Name: SP-SAC - LOCOMOTIVE WORKS
Alias Type: Alternate Name
Alias Name: SP-SAC - OVERALL SITE
Alias Type: Alternate Name
Alias Name: UNION PACIFIC RAILROAD-SACRAMENTO RAILYD
Alias Type: Alternate Name
Alias Name: UP, DOWNTOWN SAC - NORTHERN SHOPS/DRUM S
Alias Type: Alternate Name
Alias Name: 00200100440000
Alias Type: APN
Alias Name: CAD073772030
Alias Type: EPA Identification Number
Alias Name: 110000609770
Alias Type: EPA (FRS #)
Alias Name: 110012532170
Alias Type: EPA (FRS #)
Alias Name: 110033620295
Alias Type: EPA (FRS #)
Alias Name: T10000001965
Alias Type: GeoTracker Global ID
Alias Name: P14032
Alias Type: PCode
Alias Name: 100139

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Alias Type: Project Code (Site Code)
Alias Name: 34400004
Alias Type: Envirostor ID Number
Alias Name: 34400007
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 05/08/2003
Comments: RAP/ACP--DTSC approved an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safety clean up of asbestos if found during future soil excavation. In compliance with CEQA, DTSC has prepared a notice of exemption. A comment period for the project was held from February 25 through March 27, 2003. A public meeting was held on March 11, 2003. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 06/30/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 05/22/2000
Comments: DES - The DTSC approved the Final Remediation Design and Implementation Report (RDIP) on May 22, 2000, for the Northern Shops Study Area.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 02/16/2000
Comments: RAP - The DTSC approved the Final RAP, dated February 14, 2000, for the Northern Shops Study Area, which consists of 35 acres of the 240 acre SPTCo-Sacramento Rail Yard Site. The approved alternative for remediation for the 180,650 cubic yards of contaminated soils identified the RAP is excavation, land farming, chemical stabilization and, off-site disposal. Implementation of the selected alternative is schedule to begin in May of 2000 and to continue through October of 2005. The preliminary cost of the proposed alternative is estimated to be $14,353,374. CEQA/NOD - The DTSC approved the Notice of Determination for the LSA Final Amended (FARAP), and the NSSA, CSNSA, and CCSA Final Remedial Action Plan (FRAP) on February 16, 2000.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 12/31/1998
Comments: RI/FS -- THE NORTHERN SHOPS STUDY AREA (NSSA) REPRESENTS

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

APPROXIMATELY 35 ACRES OF THE 240-ACRE SPTCO-SACRAMENTO RAILYARD. THE APPROVED RIFS HAS INITIALLY IDENTIFIED 180,000 CUBIC YARDS OF CONTAMINATED SOILS THAT WILL REQUIRE OFFSITE DISPOSAL.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedy Constructed: Operating Properly & Successfully
Completed Date: 09/15/1994
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedy Constructed: Operating Properly & Successfully
Completed Date: 09/15/1994
Comments: Drum Storage Area Groundwater Treatment System Construction completed

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedy Constructed: Operating Properly & Successfully
Completed Date: 09/15/1994
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedy Constructed: Operating Properly & Successfully
Completed Date: 09/15/1994
Comments: FRA (DSVS1) and FRA (DSGW) -- The groundwater extraction and treatment and soil vapor extraction and treatment systems have been constructed at the former drum storage area facility. Normal operation of the systems began 09/15/1994.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 05/07/2003
Comments: CEQA/NOE--DTSC prepared a Notice of Exemption (NOE) for an Asbestos Contingency Plan (ACP) prepared to amend the February 2000 Final Amended Industrial Wastewater Lagoon RAP, and February 2000 Final Central Corridor, Car Shop Nine, and Northern Shops RAP for Soil. The ACP establishes the process to identify the presence of and safely clean up asbestos if found during future soil excavation. A comment period for the project was held from 2/25/03 to 3/27/03. A public meeting was held on 3/11/03. Public comments were received by DTSC and addressed through a responsiveness summary.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 02/16/2000
Comments: Notice of Determination

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement
Completed Date: 07/08/1996
Comments: ORDER (DOS&M) -- An Enforceable Agreement was completed for the Operation and Maintenance of the groundwater and vapor extraction

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

systems at the former drum storage area facility.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 07/30/1987
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Design
Completed Date: 03/09/1994
Comments: DESIGN (DSVSI) and DESIGN (DSGWI)--The designs approved extraction and treatment of VOCs and TPH in soil and groundwater at the former drum storage area facility.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 06/30/1992
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 01/07/1992
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 06/08/1990
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 02/28/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Notice
Completed Date: 07/18/2003
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: 5 Year Review Reports
Completed Date: 05/02/2008
Comments: Additional work proposed as a result of 5yr review equivelent effort.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Implementation Workplan
Completed Date: 02/01/2003
Comments: Asbestos Contingiency Plan

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 03/01/2009
Comments: Fieldwoek performed in accordance with project documents. Results will be reported in 2007-2009 Soil Summary Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Implementation Workplan
Completed Date: 05/02/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 09/17/2009
Comments: Not reported

Completed Area Name: Track 150
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 09/23/2014
Comments: Not reported

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: 5 Year Review Reports
Future Due Date: 2020
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Certification
Future Due Date: 2015
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: 5 Year Review Reports
Schedule Due Date: 06/30/2015
Schedule Revised Date: Not reported
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: Land Use Restriction
Schedule Due Date: 06/30/2015
Schedule Revised Date: Not reported

Facility ID: 60001957
Status: Active
Status Date: 01/08/2014
Site Code: 100139
Site Type: State Response
Site Type Detailed: State Response or NPL
Acres: 240
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.58422
Longitude: -121.5003
APN: NONE SPECIFIED
Past Use: NONE SPECIFIED
Potential COC: NONE SPECIFIED
Confirmed COC: NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: 100139
Alias Type: Project Code (Site Code)
Alias Name: 60001957
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: AB 2061 - Designation
Completed Date: 03/29/2007
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

WMUDS/SWAT:
Edit Date: Not reported
Complexity: Not reported
Primary Waste: CNSOIL
Primary Waste Type: Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category.
Secondary Waste: Not reported
Secondary Waste Type: Not reported
Base Meridian: Not reported
NPID: Not reported
Tonnage: 0
Regional Board ID: Not reported
Municipal Solid Waste: False
Superorder: False
Open To Public: False
Waste List: False
Agency Type: Private
Agency Name: SO. PAC. TRANSPORTATION CO.
Agency Department: Not reported
Agency Address: 1 MARKET PLAZA

UP, DOWNTOWN SAC - CAR SHOP NINE (Continued) **S101300908**

Agency City,St,Zip:	SAN FRANCISCO CA 94105
Agency Contact:	MARK RANSOM
Agency Telephone:	4155411495
Land Owner Name:	Not reported
Land Owner Address:	Not reported
Land Owner City,St,Zip:	Not reported
Land Owner Contact:	Not reported
Land Owner Phone:	Not reported
Region:	5S
Facility Type:	Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Description:	Not reported
Facility Telephone:	Not reported
SWAT Facility Name:	Not reported
Primary SIC:	4011
Secondary SIC:	Not reported
Comments:	Not reported
Last Facility Editors:	Not reported
Waste Discharge System:	True
Solid Waste Assessment Test Program:	False
Toxic Pits Cleanup Act Program:	False
Resource Conservation Recovery Act:	True
Department of Defence:	False
Solid Waste Assessment Test Program:	Not reported
Threat to Water Quality:	Not reported
Sub Chapter 15:	False
Regional Board Project Officer:	AMM
Number of WMUDS at Facility:	1
Section Range:	Not reported
RCRA Facility:	No
Waste Discharge Requirements:	H
Self-Monitoring Rept. Frequency:	Monthly Submittal
Waste Discharge System ID:	5A342000N01
Solid Waste Information ID:	Not reported

I94 **CA STATE RAILROAD MUSEUM** **CA Sacramento Co. ML** **S103707568**
SSE **111 I ST** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.034 mi.
178 ft. **Site 2 of 6 in cluster I**

Relative:
Higher

Actual:
23 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	I
Billing Codes UST:	Not reported
WG Bill Code:	Not reported
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported

CA STATE RAILROAD MUSEUM (Continued) **S103707568**

UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

I95 **BOCK F E** **EDR US Hist Auto Stat** **1009020058**
SSE **114 I ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.036 mi.
188 ft. **Site 3 of 6 in cluster I**

Relative:
Higher

Actual:
23 ft.

EDR Historical Auto Stations:

Name:	BOCK F E
Year:	1928
Type:	AUTOMOBILE REPAIRERS
Name:	BOCK F E
Year:	1928
Type:	AUTOMOBILE REPAIRERS

J96 **SP, SAC. - BATTERY SHOP** **CA BOND EXP. PLAN** **S100833177**
SE **401 "I" STREET** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.037 mi.
195 ft. **Site 13 of 16 in cluster J**

Relative:
Higher

Actual:
24 ft.

CA BOND EXP. PLAN:

Reponsible Party:	RESPONSIBLE PARTY-LEAD SITE CLEANUP WORKPLAN
Project Revenue Source Company:	Denver and Rio Grande Railroad/Southern Pacific Transportation Co.
Project Revenue Source Addr:	Not reported
Project Revenue Source City,St,Zip:	Denver/San Francisco, CO/CA
Project Revenue Source Desc:	The Department has budgeted $50,000 for oversight of the responsible parties cleanup activities. The RP has agreed to pay DHS oversight costs in the enforceable agreement on a quarterly basis. The responsible parties will pay all costs associated with cleanup.
Site Description:	The site encompasses three RCRA sites under one Court Order. The Court Order time schedule was included in an Enforceable Agreement dated June 2, 1988. These entail (a) a battery storage and disposal area (including dry well disposal), (b) a 2000 square foot drum storage area (containing solvents) and (c) a grit blast waste pile area (containing over 3100 cubic yards of sand).
Hazardous Waste Desc:	Contaminants include (a) copper, lead and petroleum hydrocarbons at the grit blast area, (b) lead and acids at the battery storage and disposal area, and (c) lead and organic compounds at the drum storage area.
Threat To Public Health & Env:	Potential pathways of exposure include ingestion, inhalation and dermal contact at all three locations. Potential receptors include humans, mammals, birds and freshwater fish. The site is within one half mile of the Sacramento and American Rivers, and seasonal fluctuation of shallow ground water direction has been confirmed.
Site Activity Status:	A third round of soil and ground water sampling was completed in September, 1988. Results from these investigations will be used to modify the analysis of remedial alternatives presented in March, 1988. A Court Order was signed July

SP, SAC. - BATTERY SHOP (Continued) **S100833177**

30, 1987. The Order set a time schedule for a combined RAP/RCRA Closure. The time schedule in the Court Order was included in an enforceable agreement with DHS dated June 2, 1988. As an interim remedial measure it is proposed to centralize contaminated soils from the Battery Shop, Drum Storage and Sand Pile sites. Stockpiled wastes will be tarped. Drainage will also be collected down slope. Wastes will be stockpiled above visqueen to prevent percolation.

J97 **SP, SAC.-LOCOMOTIVE WORKS** **CA BOND EXP. PLAN** **S100833179**
SE **401 "I" STREET** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.037 mi.
195 ft. **Site 14 of 16 in cluster J**

Relative: **Higher**

Actual: **24 ft.**

CA BOND EXP. PLAN:

Reponsible Party:	RESPONSIBLE PARTY-LEAD SITE CLEANUP WORKPLAN
Project Revenue Source Company:	Denver and Rio Grande Railroad
Project Revenue Source Addr:	Not reported
Project Revenue Source City,St,Zip:	Denver, CO
Project Revenue Source Desc:	The Department has budgeted $100,000 for oversight activities. The RP has agreed in the enforceable agreement to pay DHS oversight costs on a quarterly basis. The responsible parties will pay all costs associated with cleanup.
Site Description:	This is an old locomotive works for the cleaning and refurbishing of coal and diesel engines and railcars. The works were established in 1865.
Hazardous Waste Desc:	Known contaminants in shallow ground water include heavy metals, petroleum hydrocarbons, inorganic solvents and organic solvents. Lead is a heavy metal of particular concern. Benzene is a likely petroleum hydrocarbon contaminant. Kerosene is a likely organic solvent contaminant. Another organic solvent likely to have contaminated the site is 1,1,1-trichloroethane.
Threat To Public Health & Env:	Potential pathways of exposure include ingestion, inhalation and dermal contact. Potential receptors include humans, mammals, birds and freshwater fish. The site is located within one half mile of the Sacramento and American Rivers. Shallow ground water flow is predominantly to the East. Wells serving Bannon Street residents have been tested for organics and metals. Results showed all wells to be uncontaminated by organics and metals.
Site Activity Status:	An enforceable agreement has been implemented between DHS and the RP. A scoping document has been submitted by the RP. A work plan and schedule for investigation and cleanup was submitted October, 1988. A number of underground tanks have already been removed and have received closure approval by the RWQCB.

J98 **SP, SAC. - PONDS & DITCH** **CA BOND EXP. PLAN** **S100833178**
SE **401 "I" STREET** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.037 mi.
195 ft. **Site 15 of 16 in cluster J**

Relative: **Higher**

Actual: **24 ft.**

CA BOND EXP. PLAN:

Reponsible Party:	RESPONSIBLE PARTY-LEAD SITE CLEANUP WORKPLAN
Project Revenue Source Company:	Southern Pacific Transportation Company/Denver and Rio Grande Railroad
Project Revenue Source Addr:	Southern Pacific Building, 1 Market Plaza
Project Revenue Source City,St,Zip:	San Francisco/Denver, CA/CO 94105
Project Revenue Source Desc:	DHS has budgeted $50,000 for oversight activities. The RP has agreed to pay DHS oversight costs in the enforceable agreement on a quarterly basis. The responsible parties will pay all costs associated with cleanup.
Site Description:	Industrial waste water disposal ponds and an industrial waste water conveyance ditch are the focal points of this site investigation. A RAP/RCRA closure is required.

SP, SAC. - PONDS & DITCH (Continued) **S100833178**

Hazardous Waste Desc: Sludge and soil samples analyzed contained high concentrations of copper, lead, zinc, 1,1,1-trichloroethane, trichloroethane, tetrachloroethene, naphthalene, and bis (2-ethylhexyl) phthalate. Ground water contaminants include chromium, methylene chloride, 1,1-dichloroethane (ethylene chloride), and trans-acetylene dichloride (trans-1,2-dichloroethane).

Threat To Public Health & Env: Potential pathways of exposure include ingestion, inhalation and dermal contact. Potential receptors include humans, mammals, birds, insects, freshwater fish, nematodes, soil bacteria and grasses common to the Central Valley. The City of Sacramento has a domestic water intake from the Sacramento River located approximately one mile north of the site. Ground water is used by the State Printing Plant and Crystal Dairy for industrial purposes just north of the site. Wells serving Bannon Street residents have been tested for organics, metals and coliform organisms. Results showed all wells uncontaminated by organics and metals.

Site Activity Status: Sludge from both the ponds and ditch was excavated and disposed of at a Class I landfill in 1984 and 1985 as IRMs. Three rounds of remedial investigation have been completed at the ponds and ditch, the most recent in May, 1987. Bench scale testing of soil solidification and soil washing is now underway. Until a final design is approved, the extraction well near the ponds and ditch has been turned off. A final feasibility study (FS) was received in October, 1988.

I99 **VALLEY CLEANERS** **EDR US Hist Cleaners** **1009145554**
SSE **907 2ND ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.039 mi.
207 ft. **Site 4 of 6 in cluster I**

Relative: Higher

Actual: 24 ft.

EDR Historical Cleaners:

Name:	VALLEY CLEANERS
Year:	1928
Type:	CLEANERS AND DYERS
Name:	VALLEY CLEANERS
Year:	1928
Type:	CLEANERS AND DYERS

I100 **SHIRASAGO BENJ** **EDR US Hist Cleaners** **1009145088**
SSE **911 2ND ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.042 mi.
223 ft. **Site 5 of 6 in cluster I**

Relative: Higher

Actual: 24 ft.

EDR Historical Cleaners:

Name:	SHIRASAGO BEN
Year:	1937
Type:	CLOTHES PRESSERS AND CLEANERS
Name:	SHIRASAGO BENJ
Year:	1942
Type:	CLOTHES PRESSERS AND CLEANERS

K101 **NINA'S DELI** **CA UST** **U003850909**
West **316 6TH ST** **N/A**
< 1/8 **W SACRAMENTO, CA 95691**
0.044 mi.
230 ft. **Site 1 of 3 in cluster K**

Relative:
Higher

Actual:
26 ft.

YOLO CO. UST:

Facility Id:	FA0000578
Owner Id:	OW0002048
Owner Name:	TARIQ, MOHAMMAD
Owner Address:	316 6TH ST
Owner City/State/Zip:	W SACRAMENTO, CA 95691
Billing Name:	NINA'S DELI
Billing Address1:	316 6TH ST
Billing City/State/Zip:	W SACRAMENTO, CA 95691
Contact Name:	Not reported
Contact Phone:	Not reported
Current Status:	Inactive, non-billable
Program Element:	2306 - UST PERMANENT CLOSURE PERMIT
Business Code:	09 - UNKNOWN
Business Type:	6 - OTHER
Tank Number:	1
Tank Status:	Inactive
Tank Type:	Not reported
Tank Description:	Not reported
Tank Capacity:	350
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	Not reported
INVGEN:	000578
Tank Number:	2
Tank Status:	Inactive
Tank Type:	Not reported
Tank Description:	Not reported
Tank Capacity:	350
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	Not reported
INVGEN:	000578

K102 **JOHNNIE S CHEVRON SERVICE STATION** **EDR US Hist Auto Stat** **1009022563**
West **606 SACRAMENTO ST** **N/A**
< 1/8 **BRODERICK, CA**
0.044 mi.
233 ft. **Site 2 of 3 in cluster K**

Relative:
Higher

Actual:
27 ft.

EDR Historical Auto Stations:

Name:	JOHNNIE S CHEVRON SERVICE STATION
Year:	1956
Type:	GASOLINE STATIONS
Name:	JOHNNIE S CHEVRON SERVICE STATION
Year:	1957
Type:	GASOLINE STATIONS

I103 **SUEY K CLEANING & LAUNDRY** **EDR US Hist Cleaners** **1009146573**
SSE **922 2ND ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.048 mi.
253 ft. **Site 6 of 6 in cluster I**

Relative: EDR Historical Cleaners:
Higher
Name: SUEY K CLEANING & LAUNDRY
Year: 1966
Actual: Type: CLEANERS AND DYERS
24 ft.

K104 **SWANSON S CLEANERS STORE NO 45** **EDR US Hist Cleaners** **1009148583**
West **620 SACRAMENTO** **N/A**
< 1/8 **SACRAMENTO, CA**
0.055 mi.
293 ft. **Site 3 of 3 in cluster K**

Relative: EDR Historical Cleaners:
Higher
Name: SWANSON S CLEANERS STORE NO 45
Year: 1982
Actual: Type: CLEANERS AND DYERS
28 ft.

J105 **SUSD** **CA Sacramento Co. CS** **S104795583**
SE **425 I ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.056 mi.
294 ft. **Site 16 of 16 in cluster J**

Relative: Sacramento Co. CS:
Higher
State Site Number: R094
Lead Staff: None assigned, H.
Actual: Lead Agency: HM
25 ft. Remedial Action Taken: NO
Substance: Not reported
Date Reported: Not reported
Facility Id: RO0000636
Case Type: Not reported
Case Closed: Y
Date Closed: Not reported

L106 **UP, DOWNTOWN SAC - MANUFACTURED GAS PLANT** **EDR MGP** **1008984943**
SE **400 I STREET** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.076 mi.
403 ft. **Site 1 of 4 in cluster L**

Relative: Manufactured Gas Plants:
Higher
A new area was added in 2003, entitled the Manufactured Gas Plant (MGP) Area, which was established after discovering remnants of an MGP on the western boundary of the northern shops area during soil remediation activities in the Northern Shops area.
Actual:
26 ft.

L107 **DEPOT AUTO SERVICE** **EDR US Hist Auto Stat** **1009020520**
SE **400 I ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.076 mi.
403 ft. **Site 2 of 4 in cluster L**

Relative:
Higher

Actual:
26 ft.

EDR Historical Auto Stations:

Name:	BEARD C R
Year:	1933
Type:	GASOLINE AND OIL SERVICE STATIONS
Name:	IVES D R
Year:	1942
Type:	GASOLINE AND OIL SERVICE STATIONS
Name:	DEPOT AUTO SERVICE
Year:	1952
Type:	AUTOMOBILE REPAIRING
Name:	PETE S AUTO SERVICE
Year:	1956
Type:	AUTOMOBILE REPAIRING

L108 **UP, DOWNTOWN SAC - MANUFACTURED GAS PLANT** **CA Cortese** **S107737490**
SE **400 I STREET** **CA RESPONSE** **N/A**
< 1/8 **SACRAMENTO, CA 95814** **CA ENVIROSTOR**
0.076 mi.
403 ft. **Site 3 of 4 in cluster L**

Relative:
Higher

Actual:
26 ft.

CORTESE:

Region:	CORTESE
Envirostor Id:	70000034
Site/Facility Type:	STATE RESPONSE
Cleanup Status:	ACTIVE
Status Date:	10/01/2004
Site Code:	100139
Latitude:	38.583300
Longitude:	-121.5008
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	envirostor
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported

RESPONSE:

Facility ID:	70000034
Site Type:	State Response
Site Type Detail:	State Response or NPL
Acres:	240
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP, RWQCB 5R - Central Valley
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Ruth Cayabyab

UP, DOWNTOWN SAC - MANUFACTURED GAS PLANT (Continued) **S107737490**

Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Site Code:	100139
Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	07
Senate:	06
Special Program Status:	Not reported
Status:	Active
Status Date:	10/01/2004
Restricted Use:	NO
Funding:	Responsible Party
Latitude:	38.5833
Longitude:	-121.5008
APN:	NONE SPECIFIED
Past Use:	MANUFACTURED GAS PLANT
Potential COC :	Arsenic Benzene Lead TPH-diesel TPH-gas TPH-MOTOR OIL 1,1,1-Trichloroethane (TCA Acetone Ethylbenzene N-Nitroso di-n-propylamine Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene Toluene Xylenes
Confirmed COC:	Arsenic Benzene Lead Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene TPH-diesel TPH-gas 1,1,1-Trichloroethane (TCA Acetone Ethylbenzene N-Nitroso di-n-propylamine Toluene TPH-MOTOR OIL Xylenes
Potential Description:	AQUI, SOIL
Alias Name:	110033620302
Alias Type:	EPA (FRS #)
Alias Name:	T10000001983
Alias Type:	GeoTracker Global ID
Alias Name:	100139
Alias Type:	Project Code (Site Code)
Alias Name:	70000034
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Investigation Workplan
Completed Date:	12/09/2005
Comments:	UP submitted Draft RI Workplan
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Investigation Workplan
Completed Date:	09/30/2008
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Fieldwork
Completed Date:	05/12/2010
Comments:	Fieldwork completed. Visits by Jerod, and RWQCB Brad.
Completed Area Name:	PROJECT WIDE

UP, DOWNTOWN SAC - MANUFACTURED GAS PLANT (Continued) **S107737490**

Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 04/26/2012
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consent Order
Completed Date: 06/02/1988
Comments: Not reported

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Certification
Future Due Date: 2018
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Remedial Action Plan
Future Due Date: 2016
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Design/Implementation Workplan
Future Due Date: 2017
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Feasibility Study Report
Future Due Date: 2016
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: Remedial Investigation Report
Schedule Due Date: 06/30/2015
Schedule Revised Date: Not reported

ENVIROSTOR:
Facility ID: 70000034
Status: Active
Status Date: 10/01/2004
Site Code: 100139
Site Type: State Response
Site Type Detailed: State Response or NPL
Acres: 240
NPL: NO
Regulatory Agencies: SMBRP, RWQCB 5R - Central Valley
Lead Agency: SMBRP
Program Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.5833
Longitude: -121.5008
APN: NONE SPECIFIED
Past Use: MANUFACTURED GAS PLANT

UP, DOWNTOWN SAC - MANUFACTURED GAS PLANT (Continued) **S107737490**

Potential COC: Arsenic Benzene Lead TPH-diesel TPH-gas TPH-MOTOR OIL 1,1,1-Trichloroethane (TCA Acetone Ethylbenzene N-Nitroso di-n-propylamine Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene Toluene Xylenes

Confirmed COC: Arsenic Benzene Lead Polynuclear aromatic hydrocarbons (PAHs Acenaphthene Anthracene Benz[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Chrysene Dibenz[ah]anthracene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Pyrene TPH-diesel TPH-gas 1,1,1-Trichloroethane (TCA Acetone Ethylbenzene N-Nitroso di-n-propylamine Toluene TPH-MOTOR OIL Xylenes

Potential Description: AQUI, SOIL

Alias Name: 110033620302
Alias Type: EPA (FRS #)
Alias Name: T10000001983
Alias Type: GeoTracker Global ID
Alias Name: 100139
Alias Type: Project Code (Site Code)
Alias Name: 70000034
Alias Type: Envirostor ID Number

Completed Info:

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 12/09/2005
Comments: UP submitted Draft RI Workplan

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 09/30/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 05/12/2010
Comments: Fieldwork completed. Visits by Jerod, and RWQCB Brad.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 04/26/2012
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consent Order
Completed Date: 06/02/1988
Comments: Not reported

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Certification
Future Due Date: 2018

UP, DOWNTOWN SAC - MANUFACTURED GAS PLANT (Continued) **S107737490**

Future Area Name:	PROJECT WIDE
Future Sub Area Name:	Not reported
Future Document Type:	Remedial Action Plan
Future Due Date:	2016
Future Area Name:	PROJECT WIDE
Future Sub Area Name:	Not reported
Future Document Type:	Design/Implementation Workplan
Future Due Date:	2017
Future Area Name:	PROJECT WIDE
Future Sub Area Name:	Not reported
Future Document Type:	Feasibility Study Report
Future Due Date:	2016
Schedule Area Name:	PROJECT WIDE
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Remedial Investigation Report
Schedule Due Date:	06/30/2015
Schedule Revised Date:	Not reported

L109 **CATHAY SERVICE STATION** **EDR US Hist Auto Stat** **1009020600**
SE **430 I ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.079 mi.
417 ft. **Site 4 of 4 in cluster L**

Relative:
Higher

Actual:
26 ft.

EDR Historical Auto Stations:

Name:	FONG LAWRENCE
Year:	1942
Type:	GASOLINE AND OIL SERVICE STATIONS
Name:	CATHAY SERVICE STATION
Year:	1952
Type:	GASOLINE STATIONS
Name:	CATHAY SERVICE
Year:	1956
Type:	GASOLINE STATIONS
Name:	EIRI SHELL SERVICE
Year:	1966
Type:	GASOLINE STATIONS

M110 **CA STATE RAILROAD MUSEUM UNIT SHO** **CA Sacramento Co. ML** **S104567384**
NNE **501 JIBBOOM ST** **CA ENVIROSTOR** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.082 mi.
432 ft. **Site 1 of 2 in cluster M**

Relative:
Higher

Actual:
19 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	A
Billing Codes UST:	Not reported
WG Bill Code:	A
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported

CA STATE RAILROAD MUSEUM UNIT SHO (Continued) **S104567384**

CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

ENVIROSTOR:

Facility ID:	80001665
Status:	Certified
Status Date:	06/21/1994
Site Code:	Not reported
Site Type:	Corrective Action
Site Type Detailed:	Corrective Action
Acres:	0
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	MBR
Program Manager:	Ruth Cayabyab
Supervisor:	Charles Ridenour
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not reported
Latitude:	38.58348
Longitude:	-121.5007
APN:	NONE SPECIFIED
Past Use:	RAIL ROAD MAINTENANCE SHOP
Potential COC:	Lead TPH-diesel
Confirmed COC:	Lead TPH-diesel
Potential Description:	SOIL
Alias Name:	CAD073772030
Alias Type:	EPA Identification Number
Alias Name:	110012532170
Alias Type:	EPA (FRS #)
Alias Name:	80001665
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	Sites With No Operable Unit
Completed Sub Area Name:	SACRAMENTO STATION AREA
Completed Document Type:	Remedy Selection and Statement of Basis
Completed Date:	12/07/1989
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported

CA STATE RAILROAD MUSEUM UNIT SHO (Continued) **S104567384**

Completed Document Type: Groundwater Migration Controlled
Completed Date: 12/13/2000
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Human Exposure Controlled
Completed Date: 01/09/2004
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consent Agreement
Completed Date: 06/02/1988
Comments: Not reported

Completed Area Name: Sites With No Operable Unit
Completed Sub Area Name: SACRAMENTO STATION AREA
Completed Document Type: Design/Implementation Workplan
Completed Date: 06/30/1992
Comments: Not reported

Completed Area Name: Sites With No Operable Unit
Completed Sub Area Name: CENTRAL SHOPS AREA
Completed Document Type: Interim Measures Implementation Report
Completed Date: 04/05/1993
Comments: Not reported

Completed Area Name: Sites With No Operable Unit
Completed Sub Area Name: SOUTH PLUME AREA
Completed Document Type: Interim Measures Workplan
Completed Date: 10/20/1993
Comments: Not reported

Completed Area Name: Sites With No Operable Unit
Completed Sub Area Name: SACRAMENTO STATION AREA
Completed Document Type: RFI Report
Completed Date: 02/28/1989
Comments: Not reported

Completed Area Name: Sites With No Operable Unit
Completed Sub Area Name: CENTRAL SHOPS AREA
Completed Document Type: RFI Workplan
Completed Date: 10/18/1991
Comments: Not reported

Completed Area Name: Sites With No Operable Unit
Completed Sub Area Name: LAGOON/NORTH PLUME AREA
Completed Document Type: RFI Workplan
Completed Date: 12/17/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment Report
Completed Date: 02/01/1985
Comments: Not reported

CA STATE RAILROAD MUSEUM UNIT SHO (Continued) **S104567384**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment Report
Completed Date: 08/08/1989
Comments: Not reported

Completed Area Name: Sites With No Operable Unit
Completed Sub Area Name: SACRAMENTO STATION AREA
Completed Document Type: Corrective Measures Study Workplan
Completed Date: 01/31/1989
Comments: Not reported

Completed Area Name: Sites With No Operable Unit
Completed Sub Area Name: SACRAMENTO STATION AREA
Completed Document Type: Remedy Constructed: Operating Properly & Successfully
Completed Date: 06/21/1994
Comments: Not reported

Completed Area Name: Sites With No Operable Unit
Completed Sub Area Name: SACRAMENTO STATION AREA
Completed Document Type: Corrective Measures Study Report
Completed Date: 04/30/1989
Comments: Not reported

Completed Area Name: Sites With No Operable Unit
Completed Sub Area Name: CENTRAL SHOPS AREA
Completed Document Type: Interim Measures Workplan
Completed Date: 01/15/1993
Comments: Not reported

Completed Area Name: Sites With No Operable Unit
Completed Sub Area Name: SACRAMENTO STATION AREA
Completed Document Type: RFI Workplan
Completed Date: 01/31/1989
Comments: Not reported

Completed Area Name: Sites With No Operable Unit
Completed Sub Area Name: SOUTH PLUME AREA
Completed Document Type: RFI Workplan
Completed Date: 01/27/1992
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment Report
Completed Date: 08/08/1988
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Interim Measures Questionnaire
Completed Date: 04/25/1994
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: RCRA Facility Assessment Report

CA STATE RAILROAD MUSEUM UNIT SHO (Continued) **S104567384**

Completed Date:	09/30/1987
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Human Exposure Controlled
Completed Date:	12/13/2000
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Groundwater Migration Controlled
Completed Date:	10/23/2007
Comments:	Not reported
Future Area Name:	PROJECT WIDE
Future Sub Area Name:	Not reported
Future Document Type:	Remedy Constructed
Future Due Date:	2016
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

M111 **SACRAMENTO RAILYARDS - CITY OF SACRAMENTO** **RCRA-LQG** **1016954649**
NNE **501 JIBBOOM ST** **CAL000366448**
< 1/8 **SACRAMENTO, CA 95814**
0.082 mi.
432 ft. **Site 2 of 2 in cluster M**

Relative:
Higher

Actual:
19 ft.

RCRA-LQG:

Date form received by agency:	03/01/2014
Facility name:	SACRAMENTO RAILYARDS - CITY OF SACRAMENTO
Facility address:	501 JIBBOOM ST SACRAMENTO, CA 95814
EPA ID:	CAL000366448
Mailing address:	I ST - 4TH FL - RISK MGMT SACRAMENTO, CA 95814
Contact:	DAN D DRISCOLL
Contact address:	I ST - 4TH FL - RISK MGMT SACRAMENTO, CA 95814
Contact country:	Not reported
Contact telephone:	(916) 808-2276
Contact email:	DDRISLCOLL@CITYOFSACRAMENTO.ORG
EPA Region:	09
Classification:	Large Quantity Generator
Description:	Handler: generates 1,000 kg or more of hazardous waste during any calendar month; or generates more than 1 kg of acutely hazardous waste during any calendar month; or generates more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month; or generates 1 kg or less of acutely hazardous waste during any calendar month, and accumulates more than 1 kg of acutely hazardous waste at any time; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates more than

SACRAMENTO RAILYARDS - CITY OF SACRAMENTO (Continued) **1016954649**

100 kg of that material at any time

Owner/Operator Summary:

Owner/operator name:	CITY OF SACRAMENTO
Owner/operator address:	I ST - 4TH FL - RISK MGMT
	SACRAMENTO, CA 95814
Owner/operator country:	Not reported
Owner/operator telephone:	(916) 808-2276
Legal status:	Municipal
Owner/Operator Type:	Owner
Owner/Op start date:	01/01/1950
Owner/Op end date:	Not reported
Owner/operator name:	CITY OF SACRAMENTO
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Municipal
Owner/Operator Type:	Operator
Owner/Op start date:	01/01/1950
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

. Waste code:	D008
. Waste name:	LEAD

Violation Status: No violations found

N112 **RALEY'S LANDING** **CA UST** **U004191920**
WSW **500 E ST** **N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
0.097 mi.
512 ft. **Site 1 of 6 in cluster N**

Relative:
Higher

Actual:
23 ft.

YOLO CO. UST:

Facility Id:	FA0000474
Owner Id:	OW0000390
Owner Name:	RALEY'S LANDING
Owner Address:	100 W CAPITOL AVE
Owner City/State/Zip:	W SACRAMENTO, CA 95605
Billing Name:	RALEY'S LANDING

RALEY'S LANDING (Continued) **U004191920**

Billing Address1:	100 W CAPITOL AVENUE
Billing City/State/Zip:	WEST SACRAMENTO, CA 95691
Contact Name:	Not reported
Contact Phone:	Not reported
Current Status:	Inactive, non-billable
Program Element:	2306 - UST PERMANENT CLOSURE PERMIT
Business Code:	09 - UNKNOWN
Business Type:	6 - OTHER
Tank Number:	1
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	12,408
Product Type:	Diesel
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	Not reported
INVGEN:	000474
Tank Number:	1
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	1,000
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	Not reported
INVGEN:	000527
Tank Number:	1
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	550
Product Type:	Regular Unleaded
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	Not reported
INVGEN:	002652

N113 **OLD TRAILWAYS PROP** **CA HIST CORTESE** **S104536169**
WSW **500 E ST** **CA LUST** **N/A**
< 1/8 **WEST SACRAMENTO, CA 95691** **CA LOS ANGELES CO. HMS**
0.097 mi.
512 ft. **Site 2 of 6 in cluster N**

Relative:
Higher

Actual:
23 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	57
Reg By:	LTNKA
Reg Id:	570093

LUST:

Region:	STATE
Global Id:	T0611300065

OLD TRAILWAYS PROP (Continued) **S104536169**

Latitude:	38.5862063
Longitude:	-121.5133261
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	10/22/1992
Lead Agency:	YOLO COUNTY
Case Worker:	Not reported
Local Agency:	Not reported
RB Case Number:	570093
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Diesel
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0611300065
Contact Type:	Regional Board Caseworker
Contact Name:	DAVID STAVAREK
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	dstavarek@waterboards.ca.gov
Phone Number:	Not reported

Status History:

Global Id:	T0611300065
Status:	Completed - Case Closed
Status Date:	10/22/1992
Global Id:	T0611300065
Status:	Open - Case Begin Date
Status Date:	07/28/1989
Global Id:	T0611300065
Status:	Open - Remediation
Status Date:	07/28/1989

Regulatory Activities:

Global Id:	T0611300065
Action Type:	Other
Date:	07/28/1989
Action:	Leak Discovery
Global Id:	T0611300065
Action Type:	ENFORCEMENT
Date:	10/22/1992
Action:	Closure/No Further Action Letter
Global Id:	T0611300065
Action Type:	Other
Date:	07/28/1989
Action:	Leak Stopped
Global Id:	T0611300065

OLD TRAILWAYS PROP (Continued) **S104536169**

Action Type: Other
Date: 07/28/1989
Action: Leak Reported

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 570093
Case Type: Soil only
Substance: DIESEL
Staff Initials: DFS
Lead Agency: Local
Program: LUST
MTBE Code: N/A

LOS ANGELES CO. HMS:
Region: LA
Facility Id: 014466-015061
Facility Type: T0
Facility Status: Removed
Area: 4A
Permit Number: 00005827T
Permit Status: Removed

N114 **ON THE BALL GRAPHICS** **CA HIST CORTESE S102434688**
WSW **500 5TH ST** **CA LUST N/A**
< 1/8 **WEST SACRAMENTO, CA 95691**
0.098 mi.
519 ft. **Site 3 of 6 in cluster N**

Relative:
Higher

Actual:
23 ft.

HIST CORTESE:
Region: CORTESE
Facility County Code: 57
Reg By: LTNKA
Reg Id: 570199

LUST:
Region: STATE
Global Id: T0611300154
Latitude: 38.5861794
Longitude: -121.5133407
Case Type: LUST Cleanup Site
Status: Completed - Case Closed
Status Date: 03/08/1988
Lead Agency: YOLO COUNTY
Case Worker: Not reported
Local Agency: Not reported
RB Case Number: 570199
LOC Case Number: Not reported
File Location: Not reported
Potential Media Affect: Soil
Potential Contaminants of Concern: Gasoline
Site History: Not reported

ON THE BALL GRAPHICS (Continued) **S102434688**

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0611300154
Contact Type:	Regional Board Caseworker
Contact Name:	DAVID STAVAREK
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	dstavarek@waterboards.ca.gov
Phone Number:	Not reported

Status History:

Global Id:	T0611300154
Status:	Open - Case Begin Date
Status Date:	03/08/1988

Global Id:	T0611300154
Status:	Completed - Case Closed
Status Date:	03/08/1988

Regulatory Activities:

Global Id:	T0611300154
Action Type:	Other
Date:	03/08/1988
Action:	Leak Discovery

Global Id:	T0611300154
Action Type:	Other
Date:	03/08/1988
Action:	Leak Stopped

Global Id:	T0611300154
Action Type:	Other
Date:	03/08/1988
Action:	Leak Reported

LUST REG 5:

Region:	5
Status:	Case Closed
Case Number:	570199
Case Type:	Soil only
Substance:	GASOLINE
Staff Initials:	DFS
Lead Agency:	Local
Program:	LUST
MTBE Code:	N/A

N115 **PACIFIC TRAILWAYS** **CA FID UST** **S101629716**
WSW **520 E ST** **CA SWEEPS UST** **N/A**
< 1/8 **SACRAMENTO, CA 95605**
0.101 mi.
531 ft. **Site 4 of 6 in cluster N**

Relative:
Higher

Actual:
23 ft.

CA FID UST:

Facility ID:	34007318
Regulated By:	UTNKA
Regulated ID:	00068596
Cortese Code:	Not reported
SIC Code:	Not reported
Facility Phone:	9163711240
Mail To:	Not reported
Mailing Address:	520 E ST
Mailing Address 2:	Not reported
Mailing City,St,Zip:	SACRAMENTO 95605
Contact:	Not reported
Contact Phone:	Not reported
DUNs Number:	Not reported
NPDES Number:	Not reported
EPA ID:	Not reported
Comments:	Not reported
Status:	Active

SWEEPS UST:

Status:	Active
Comp Number:	68596
Number:	9
Board Of Equalization:	Not reported
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	1
SWRCB Tank Id:	34-000-068596-000001
Tank Status:	A
Capacity:	12000
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	DIESEL
Number Of Tanks:	1

N116 **PACIFIC TRAILWAYS** **CA HIST UST** **U001612330**
WSW **520 E STREET** **N/A**
< 1/8 **SACRAMENTO, CA 95605**
0.101 mi.
531 ft. **Site 5 of 6 in cluster N**

Relative:
Higher

Actual:
23 ft.

HIST UST:

Region:	STATE
Facility ID:	00000068596
Facility Type:	Other
Other Type:	BUS MAINTENANCE GARA
Contact Name:	Not reported
Telephone:	9163711240
Owner Name:	TRAILWAYS, INC.
Owner Address:	13760 NOEL ROAD
Owner City,St,Zip:	DALLAS, TX 75240

PACIFIC TRAILWAYS (Continued) **U001612330**

Total Tanks: 0001

Tank Num: 001
Container Num: 1
Year Installed: 1976
Tank Capacity: 00012000
Tank Used for: WASTE
Type of Fuel: 4
Container Construction Thickness: X
Leak Detection: Visual

O117 **SAM LIM** **EDR US Hist Cleaners** **1009144311**
SSE **315 J ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.108 mi.
571 ft. **Site 1 of 5 in cluster O**

Relative:
Higher

Actual:
25 ft.

EDR Historical Cleaners:
Name: SAM LIM
Year: 1937
Type: LAUNDRIES-CHINESE

Name: FOO CHONG
Year: 1942
Type: LAUNDRIES-ORIENTAL

O118 **SAM S LAUNDRY & DRY CLEANER** **EDR US Hist Cleaners** **1009145723**
SSE **304 J ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.109 mi.
578 ft. **Site 2 of 5 in cluster O**

Relative:
Higher

Actual:
25 ft.

EDR Historical Cleaners:
Name: SAM S LAUNDRY & DRY CLEANER
Year: 1956
Type: LAUNDRIES

---

119 **SKELLY WM** **EDR US Hist Auto Stat** **1009021695**
WNW **611 WILLIAMS AVE** **N/A**
< 1/8 **BRODERICK, CA**
0.111 mi.
588 ft.

Relative:
Higher

Actual:
22 ft.

EDR Historical Auto Stations:
Name: SKELLY WM
Year: 1947
Type: AUTOMOBILE REPAIRING

P120 **LEE SAM** **EDR US Hist Cleaners** **1009144322**
SSE **225 J ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.112 mi.
590 ft. **Site 1 of 11 in cluster P**

Relative: Higher

Actual: 24 ft.

EDR Historical Cleaners:

Name:	LEE SAM
Year:	1942
Type:	LAUNDRIES-ORIENTAL

P121 **MIRO LAURENT** **EDR US Hist Cleaners** **1009148110**
SSE **207 J ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.112 mi.
593 ft. **Site 2 of 11 in cluster P**

Relative: Higher

Actual: 24 ft.

EDR Historical Cleaners:

Name:	MIRO LAURENT
Year:	1933
Type:	LAUNDRIES-HAND

P122 **FLASH 1 HR PHOTO** **CA Sacramento Co. ML** **S102316234**
SSE **127 J ST** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.113 mi.
596 ft. **Site 3 of 11 in cluster P**

Relative: Higher

Actual: 23 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	Not reported
Billing Codes UST:	Not reported
WG Bill Code:	I
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

P123 **FLASH ONE HOUR PHOTO** **RCRA-SQG** **1000857362**
SSE **127 J ST** **FINDS** **CAD983667932**
< 1/8 **SACRAMENTO, CA 95814** **CA HAZNET**
0.113 mi.
596 ft. **Site 4 of 11 in cluster P**

Relative:
Higher

Actual:
23 ft.

RCRA-SQG:

Date form received by agency:	12/12/1996
Facility name:	FLASH ONE HOUR PHOTO
Facility address:	127 J ST SACRAMENTO, CA 95814
EPA ID:	CAD983667932
Contact:	KATHRYN TAVARES
Contact address:	127 J ST SACRAMENTO, CA 95814
Contact country:	US
Contact telephone:	(916) 443-8580
Contact email:	Not reported
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	KATHRN A TAVARES
Owner/operator address:	127 J ST SACRAMENTO, CA 95814
Owner/operator country:	Not reported
Owner/operator telephone:	(916) 443-8580
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Violation Status: No violations found

FINDS:

Registry ID: 110002898892

FLASH ONE HOUR PHOTO (Continued) **1000857362**

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

HAZNET:

envid:	1000857362
Year:	1998
GEPAID:	CAD983667932
Contact:	KATHRYN A TAVARES
Telephone:	9164438580
Mailing Name:	Not reported
Mailing Address:	127 J ST
Mailing City,St,Zip:	SACRAMENTO, CA 958142206
Gen County:	Not reported
TSD EPA ID:	CAL000121946
TSD County:	Not reported
Waste Category:	Photochemicals/photoprocessing waste
Disposal Method:	Recycler
Tons:	.3127
Facility County:	Sacramento

envid:	1000857362
Year:	1997
GEPAID:	CAD983667932
Contact:	KATHRYN A TAVARES
Telephone:	9164438580
Mailing Name:	Not reported
Mailing Address:	127 J ST
Mailing City,St,Zip:	SACRAMENTO, CA 958142206
Gen County:	Not reported
TSD EPA ID:	CAL000121946
TSD County:	Not reported
Waste Category:	Photochemicals/photoprocessing waste
Disposal Method:	Recycler
Tons:	.4586
Facility County:	Sacramento

envid:	1000857362
Year:	1996
GEPAID:	CAD983667932
Contact:	KATHRYN A TAVARES
Telephone:	9164438580
Mailing Name:	Not reported
Mailing Address:	127 J ST
Mailing City,St,Zip:	SACRAMENTO, CA 958142206
Gen County:	Not reported
TSD EPA ID:	CAL000121946
TSD County:	Not reported
Waste Category:	Photochemicals/photoprocessing waste
Disposal Method:	Recycler
Tons:	.4586
Facility County:	Sacramento

FLASH ONE HOUR PHOTO (Continued) **1000857362**

envid: 1000857362
Year: 1995
GEPAID: CAD983667932
Contact: KATHRYN A TAVARES
Telephone: 9164438580
Mailing Name: Not reported
Mailing Address: 127 J ST
Mailing City,St,Zip: SACRAMENTO, CA 958142206
Gen County: Not reported
TSD EPA ID: CAL000121946
TSD County: Not reported
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Tons: .2293
Facility County: Sacramento

envid: 1000857362
Year: 1995
GEPAID: CAD983667932
Contact: KATHRYN A TAVARES
Telephone: 9164438580
Mailing Name: Not reported
Mailing Address: 127 J ST
Mailing City,St,Zip: SACRAMENTO, CA 958142206
Gen County: Not reported
TSD EPA ID: CAD070148432
TSD County: Not reported
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Tons: .2293
Facility County: Sacramento

Click this hyperlink while viewing on your computer to access additional CA_HAZNET: detail in the EDR Site Report.

P124 **HOP WO LAUNDRY** **EDR US Hist Cleaners** **1009148024**
SSE **212 J ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.114 mi.
602 ft. **Site 5 of 11 in cluster P**

Relative:
Higher

Actual:
24 ft.

EDR Historical Cleaners:
Name: HOP WO LAUNDRY
Year: 1956
Type: LAUNDRIES

P125 **WAH HOP** **EDR US Hist Cleaners** **1009144333**
SSE **204 J ST** **N/A**
< 1/8 **SACRAMENTO, CA**
0.114 mi.
603 ft. **Site 6 of 11 in cluster P**

Relative:
Higher

Actual:
24 ft.

EDR Historical Cleaners:
Name: WAH HOP
Year: 1937
Type: LAUNDRIES-CHINESE

WAH HOP (Continued) **1009144333**

Name: WAH HOP
Year: 1942
Type: LAUNDRIES-ORIENTAL

N126 **BOUGHTON W S** **EDR US Hist Auto Stat** **1009021129**
WSW **520 5TH ST** **N/A**
< 1/8 **BRODERICK, CA**
0.116 mi.
611 ft. **Site 6 of 6 in cluster N**

Relative: Higher

Actual: 23 ft.

EDR Historical Auto Stations:

Name: BOUGHTON W S
Year: 1928
Type: GASOLINE AND OIL SERVICE STATIONS

Name: BOUGHTON W S
Year: 1928
Type: GASOLINE AND OIL SERVICE STATIONS

Name: SMITH D B
Year: 1933
Type: GASOLINE AND OIL SERVICE STATIONS

---

127 **DELTA KING** **CA Sacramento Co. ML** **S105269360**
South **1000 FRONT ST** **N/A**
< 1/8 **SACRAMENTO, CA 95814**
0.120 mi.
633 ft.

Relative: Higher

Actual: 23 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Disclaimer
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	50
Food Bill Code:	50
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

128
West
< 1/8
0.120 mi.
636 ft.

JOHNNIE S CHEVRON SERVICE STATION
660 SACRAMENTO ST
BRODERICK, CA

EDR US Hist Auto Stat
1009022579
N/A

Relative:
Higher

Actual:
28 ft.

EDR Historical Auto Stations:

Name:	JOHNNIE S CHEVRON SERVICE STATION
Year:	1961
Type:	GASOLINE STATIONS
Name:	JOHNNIE S CHEVRON SERVICE STATION
Year:	1966
Type:	GASOLINE STATIONS
Name:	JOHNNIE S CHEVRON SERVICE STATION
Year:	1970
Type:	GASOLINE STATIONS

O129
SSE
< 1/8
0.123 mi.
650 ft.

HOY-BIN AUTO SERVICE
331 J ST
SACRAMENTO, CA

Site 3 of 5 in cluster O

EDR US Hist Auto Stat
1009021389
N/A

Relative:
Higher

Actual:
25 ft.

EDR Historical Auto Stations:

Name:	HOY-BIN AUTO SERVICE
Year:	1952
Type:	GASOLINE STATIONS
Name:	TOWER BRIDGE SERVICE STATION
Year:	1956
Type:	GASOLINE STATIONS

O130
SSE
1/8-1/4
0.127 mi.
671 ft.

FRIEDMAN ISADORE
1019 3RD ST
SACRAMENTO, CA

Site 4 of 5 in cluster O

EDR US Hist Cleaners
1009143796
N/A

Relative:
Higher

Actual:
25 ft.

EDR Historical Cleaners:

Name:	FRIEDMAN ISADORE
Year:	1937
Type:	CLOTHES PRESSERS AND CLEANERS
Name:	FRIEDMAN ISADORE
Year:	1942
Type:	CLOTHES PRESSERS AND CLEANERS
Name:	LEE ELLEN MRS
Year:	1952
Type:	CLEANERS AND DYERS

O131 **LEE S ELLEN LAUNDRY** **EDR US Hist Cleaners** **1009145717**
SSE **1021 3RD ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.128 mi.
678 ft. **Site 5 of 5 in cluster O**

Relative:
Higher

Actual:
25 ft.

EDR Historical Cleaners:

Name:	LEE S ELLEN LAUNDRY
Year:	1956
Type:	LAUNDRIES

Q132 **EMPTY LOT** **CA Sacramento Co. ML** **S105267526**
SSE **4TH/J ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95816**
0.131 mi.
694 ft. **Site 1 of 17 in cluster Q**

Relative:
Higher

Actual:
26 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

Q133 **LEE IRENE MRS** **EDR US Hist Cleaners** **1009144319**
SSE **902 4TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.132 mi.
698 ft. **Site 2 of 17 in cluster Q**

Relative:
Higher

Actual:
26 ft.

EDR Historical Cleaners:

Name:	LEE IRENE MRS
Year:	1942
Type:	LAUNDRIES-ORIENTAL

Q134 **EDR US Hist Cleaners** **1015055455**
SSE **403 J ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.133 mi.
701 ft. **Site 3 of 17 in cluster Q**

Relative:
Higher

Actual:
26 ft.

EDR Historical Cleaners:
Name: SACRAMENTO CARPET CLEANING
Year: 2010
Address: 403 J ST

Q135 **WAH LUN** **EDR US Hist Cleaners** **1009145173**
SSE **908 4TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.133 mi.
701 ft. **Site 4 of 17 in cluster Q**

Relative:
Higher

Actual:
26 ft.

EDR Historical Cleaners:
Name: WAH LUN
Year: 1933
Type: CLOTHES PRESSERS AND CLEANERS

Q136 **WEISBERG DAVID** **EDR US Hist Cleaners** **1009145177**
SSE **402 J ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.134 mi.
709 ft. **Site 5 of 17 in cluster Q**

Relative:
Higher

Actual:
26 ft.

EDR Historical Cleaners:
Name: WEISBERG DAVID
Year: 1933
Type: CLOTHES PRESSERS AND CLEANERS

Name: WEISBERG DAVID
Year: 1937
Type: CLOTHES PRESSERS AND CLEANERS

Name: WEISBERG DAVID
Year: 1942
Type: CLOTHES PRESSERS AND CLEANERS

Name: WEISBERG DAVID
Year: 1952
Type: CLEANERS AND DYERS

P137 **EDR US Hist Auto Stat** **1015123388**
SSE **1008 2ND ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.138 mi.
727 ft. **Site 7 of 11 in cluster P**

Relative:
Higher

Actual:
24 ft.

EDR Historical Auto Stations:
Name: G12 ALIGNMENT & BRAKE INC
Year: 2008
Address: 1008 2ND ST

R138 **W SAC PUBLIC WORKS** **CA UST** **U004004447**
SSW **201 F ST** **N/A**
1/8-1/4 **WEST SACRAMENTO, CA 95691**
0.139 mi.
735 ft. **Site 1 of 3 in cluster R**

Relative:
Higher

Actual:
27 ft.

YOLO CO. UST:

Facility Id:	FA0000570
Owner Id:	OW0000105
Owner Name:	CITY OF WEST SACRAMENTO
Owner Address:	1951 SOUTH RIVER RD
Owner City/State/Zip:	WEST SACRAMENTO, CA 95691
Billing Name:	RALEY'S LANDING PUMP STATION
Billing Address1:	1951 SOUTH RIVER ROAD
Billing City/State/Zip:	WEST SACRAMENTO, CA 95691
Contact Name:	LILLEY, CHUCK
Contact Phone:	916-373-5850, 916-371-0450
Current Status:	Inactive, non-billable
Program Element:	2306 - UST PERMANENT CLOSURE PERMIT
Business Code:	09 - UNKNOWN
Business Type:	6 - OTHER
Tank Number:	1
Tank Status:	Inactive
Tank Type:	Motor vehicle
Tank Description:	SINGLE-WALL
Tank Capacity:	1,000
Product Type:	Diesel
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	11/14/96
INVGEN:	1996000570

R139 **RAGSDALE J B** **EDR US Hist Auto Stat** **1009021912**
SSW **601 2ND ST** **N/A**
1/8-1/4 **BRODERICK, CA**
0.139 mi.
736 ft. **Site 2 of 3 in cluster R**

Relative:
Higher

Actual:
27 ft.

EDR Historical Auto Stations:

Name:	RAGSDALE J B
Year:	1928
Type:	AUTOMOBILE REPAIRERS
Name:	RAGSDALE J B
Year:	1928
Type:	AUTOMOBILE REPAIRERS

R140 **BRODERICK AUTO SERVICE** **EDR US Hist Auto Stat** **1009021015**
SSW **219 F ST** **N/A**
1/8-1/4 **BRODERICK, CA**
0.142 mi.
750 ft. **Site 3 of 3 in cluster R**

Relative:
Higher

Actual:
27 ft.

EDR Historical Auto Stations:

Name:	HARD PERCIVAL
Year:	1947
Type:	AUTOMOBILE REPAIRING

BRODERICK AUTO SERVICE (Continued) **1009021015**

Name: BRODERICK AUTO SERVICE
Year: 1952
Type: AUTOMOBILE REPAIRING

Name: NELSON S GARAGE
Year: 1956
Type: AUTOMOBILE REPAIRING

Name: NELSON S GARAGE
Year: 1957
Type: AUTOMOBILE REPAIRING

Name: NELSON S GARAGE
Year: 1961
Type: AUTOMOBILE REPAIRING

Name: NELSON S GARAGE
Year: 1966
Type: AUTOMOBILE REPAIRING

Name: NELSON S GARAGE
Year: 1970
Type: AUTOMOBILE REPAIRING

Name: NELSON S GARAGE
Year: 1975
Type: AUTOMOBILE REPAIRING

Name: NELSON S GARAGE
Year: 1982
Type: AUTOMOBILE REPAIRING

Q141 **JAY STREET LAUNDRY** **EDR US Hist Cleaners** **1009144317**
SSE **420 J ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.142 mi.
751 ft. **Site 6 of 17 in cluster Q**

Relative:
Higher

Actual:
27 ft.

EDR Historical Cleaners:
Name: JAY STREET LAUNDRY
Year: 1942
Type: LAUNDRIES-ORIENTAL

Q142 **D & A PROPERTIES** **CA Sacramento Co. ML** **S105269902**
SSE **429 J ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.145 mi.
764 ft. **Site 7 of 17 in cluster Q**

Relative:
Higher

Actual:
27 ft.

Sacramento Co. ML:
Facility Id: Not reported
Facility Status: Inactive. Included on a listing no longer updated.
FD: U
Billing Codes BP: Out of Business
Billing Codes UST: No Tanks
WG Bill Code: Oil Changed by Outside Company-No Fee

D & A PROPERTIES (Continued) **S105269902**

Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

Q143 **C.O.P.Y.** **CA Sacramento Co. ML** **S105267182**
SSE **1012 4TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.145 mi.
766 ft. **Site 8 of 17 in cluster Q**

Relative:
Higher

Actual:
26 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Disclaimer
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	50
Food Bill Code:	50
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

Q144 **WRIGHT H A** **EDR US Hist Cleaners** **1009147590**
SSE **1007 4TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.145 mi.
767 ft. **Site 9 of 17 in cluster Q**

Relative:
Higher

Actual:
26 ft.

EDR Historical Cleaners:

Name:	WRIGHT H A
Year:	1952
Type:	CLEANERS AND DYERS

WRIGHT H A (Continued) **1009147590**

Name: LEE SAM LAUNDRY
Year: 1956
Type: LAUNDRIES

Q145 **FONG MING** **EDR US Hist Cleaners** **1009144310**
SSE **1016 4TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.146 mi.
769 ft. **Site 10 of 17 in cluster Q**

Relative:
Higher

Actual:
26 ft.

EDR Historical Cleaners:
Name: FONG MING
Year: 1942
Type: LAUNDRIES-ORIENTAL

Q146 **FONG MING** **EDR US Hist Cleaners** **1009148122**
SSE **1009 4TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.146 mi.
769 ft. **Site 11 of 17 in cluster Q**

Relative:
Higher

Actual:
26 ft.

EDR Historical Cleaners:
Name: FONG MING
Year: 1937
Type: LAUNDRIES-CHINESE

Q147 **PARKING LOT D 510 DOWNTOWN PZ** **CA LUST** **S103981309**
SSE **428 J ST** **CA Sacramento Co. ML** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.146 mi.
772 ft. **Site 12 of 17 in cluster Q**

Relative:
Higher

Actual:
27 ft.

LUST:

Region:	STATE
Global Id:	T0606700528
Latitude:	38.5822664
Longitude:	-121.5008611
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	02/24/1993
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	DWB
Local Agency:	SACRAMENTO COUNTY LOP
RB Case Number:	340623
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Diesel
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606700528
Contact Type:	Regional Board Caseworker

PARKING LOT D 510 DOWNTOWN PZ (Continued) **S103981309**

Contact Name: VERA FISCHER
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: vera.fischer@waterboards.ca.gov
Phone Number: Not reported

Global Id: T0606700528
Contact Type: Local Agency Caseworker
Contact Name: DANA BOOTH
Organization Name: SACRAMENTO COUNTY LOP
Address: 8475 JACKSON ROAD, SUITE 240
City: SACRAMENTO
Email: boothd@saccounty.net
Phone Number: Not reported

Status History:
Global Id: T0606700528
Status: Completed - Case Closed
Status Date: 02/24/1993

Global Id: T0606700528
Status: Open - Case Begin Date
Status Date: 05/22/1992

Global Id: T0606700528
Status: Open - Remediation
Status Date: 05/22/1992

Global Id: T0606700528
Status: Open - Site Assessment
Status Date: 05/22/1992

Regulatory Activities:
Global Id: T0606700528
Action Type: Other
Date: 05/22/1992
Action: Leak Discovery

Global Id: T0606700528
Action Type: Other
Date: 06/02/1992
Action: Leak Reported

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 340623
Case Type: Soil only
Substance: DIESEL
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

PARKING LOT D 510 DOWNTOWN PZ (Continued) **S103981309**

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	I
Billing Codes UST:	I
WG Bill Code:	I
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

Q148 **EDR US Hist Auto Stat** **1015490738**
SSE **428 J ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.146 mi.
772 ft. **Site 13 of 17 in cluster Q**

Relative:
Higher

Actual:
27 ft.

EDR Historical Auto Stations:

Name:	ALLIANCE OF AUTOMOBILE MFR INC
Year:	2004
Address:	428 J ST

Q149 **SACRAMENTO PRINTERY** **CA Sacramento Co. ML** **S106665398**
SSE **428 J ST # 110** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.146 mi.
772 ft. **Site 14 of 17 in cluster Q**

Relative:
Higher

Actual:
27 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported

SACRAMENTO PRINTERY (Continued) **S106665398**

Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

Q150 **CHEW JACK** **EDR US Hist Cleaners** **1009146090**
SSE **1019 4TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.147 mi.
775 ft. **Site 15 of 17 in cluster Q**

Relative:
Higher

Actual:
26 ft.

EDR Historical Cleaners:

Name:	CHEW JACK
Year:	1947
Type:	CLOTHES PRESSERS AND CLEANERS
Name:	CHEW JACK
Year:	1952
Type:	CLEANERS AND DYERS
Name:	FONG LAUNDRY
Year:	1956
Type:	LAUNDRIES

S151 **SOUTHSIDE VENDING** **CA SWEEPS UST** **S106932431**
SE **848 5TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95819**
0.149 mi.
789 ft. **Site 1 of 14 in cluster S**

Relative:
Higher

Actual:
32 ft.

SWEEPS UST:

Status:	Active
Comp Number:	3900
Number:	9
Board Of Equalization:	44-018751
Referral Date:	03-08-89
Action Date:	03-08-89
Created Date:	03-08-89
Owner Tank Id:	Not reported
SWRCB Tank Id:	34-000-003900-000001
Tank Status:	A
Capacity:	3000
Active Date:	03-08-89
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	1

S152 **CITY OF SACRAMENTO PUBLIC SAFE** **CA HIST UST** **U001615069**
SE **801 5TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.152 mi.
800 ft. **Site 2 of 14 in cluster S**

Relative:
Higher

Actual:
32 ft.

HIST UST:

Region:	STATE
Facility ID:	00000038346
Facility Type:	Other
Other Type:	GARAGE
Contact Name:	LYLE KELLEY
Telephone:	9164495436
Owner Name:	CITY OF SACRAMENTO
Owner Address:	5730 24TH ST.
Owner City,St,Zip:	SACRAMENTO, CA 95822
Total Tanks:	0013
Tank Num:	001
Container Num:	PS-101-U
Year Installed:	1978
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	1/4
Leak Detection:	Stock Inventor
Tank Num:	002
Container Num:	PS-102
Year Installed:	1978
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	1/4
Leak Detection:	Stock Inventor
Tank Num:	003
Container Num:	PS-103-U
Year Installed:	1978
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	1/4
Leak Detection:	Stock Inventor
Tank Num:	004
Container Num:	PS-104-U
Year Installed:	1978
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	1/4
Leak Detection:	Stock Inventor
Tank Num:	005
Container Num:	PS-105-MO
Year Installed:	1978
Tank Capacity:	00001000
Tank Used for:	PRODUCT

CITY OF SACRAMENTO PUBLIC SAFE (Continued) **U001615069**

Type of Fuel:	Not reported
Container Construction Thickness:	10
Leak Detection:	Stock Inventor
Tank Num:	006
Container Num:	PS-106-WO
Year Installed:	1978
Tank Capacity:	00000550
Tank Used for:	WASTE
Type of Fuel:	WASTE OIL
Container Construction Thickness:	12
Leak Detection:	Stock Inventor
Tank Num:	007
Container Num:	PS-107-AF
Year Installed:	1978
Tank Capacity:	00000550
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	12
Leak Detection:	Stock Inventor
Tank Num:	008
Container Num:	PS-108-U
Year Installed:	Not reported
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	1/4
Leak Detection:	Stock Inventor
Tank Num:	009
Container Num:	CC-101-D
Year Installed:	1983
Tank Capacity:	00004000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	010
Container Num:	WR-101
Year Installed:	1968
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	1/4
Leak Detection:	Stock Inventor
Tank Num:	011
Container Num:	WR-102
Year Installed:	1974
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	1/4
Leak Detection:	Stock Inventor

CITY OF SACRAMENTO PUBLIC SAFE (Continued) **U001615069**

Tank Num:	012
Container Num:	WR-103-D
Year Installed:	1974
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	1/4
Leak Detection:	Stock Inventor

Tank Num:	013
Container Num:	WR-104-WO
Year Installed:	1968
Tank Capacity:	00000550
Tank Used for:	WASTE
Type of Fuel:	WASTE OIL
Container Construction Thickness:	12
Leak Detection:	Stock Inventor

S153 **SAFETY GARAGE** **CA HIST CORTESE** **S102436251**
SE **801 5TH ST** **CA LUST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814** **CA Sacramento Co. CS**
0.152 mi. **CA Sacramento Co. ML**
800 ft. **Site 3 of 14 in cluster S**

Relative:
Higher

Actual:
32 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	LTNKA
Reg Id:	341019

LUST:

Region:	STATE
Global Id:	T0606700847
Latitude:	38.5831533
Longitude:	-121.4996073
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	12/05/1996
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	Not reported
Local Agency:	Not reported
RB Case Number:	341019
LOC Case Number:	B211
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606700847
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov

SAFETY GARAGE (Continued) **S102436251**

Phone Number: Not reported

Status History:
Global Id: T0606700847
Status: Completed - Case Closed
Status Date: 12/05/1996

Global Id: T0606700847
Status: Open - Case Begin Date
Status Date: 04/03/1995

Global Id: T0606700847
Status: Open - Site Assessment
Status Date: 04/06/1995

Regulatory Activities:
Global Id: T0606700847
Action Type: Other
Date: 04/03/1995
Action: Leak Discovery

Global Id: T0606700847
Action Type: ENFORCEMENT
Date: 12/05/1996
Action: Closure/No Further Action Letter

Global Id: T0606700847
Action Type: Other
Date: 11/22/1996
Action: Leak Reported

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 341019
Case Type: Soil only
Substance: GASOLINE
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

Sacramento Co. CS:
State Site Number: B211
Lead Staff: Marcus, B.
Lead Agency: HM
Remedial Action Taken: YE, S
Substance: Automotive(motor gasoline and additives)
Date Reported: 04/05/1995
Facility Id: RO0000100
Case Type: Soil only
Case Closed: Y
Date Closed: 12/05/1996

SAFETY GARAGE (Continued) **S102436251**

Sacramento Co. ML:

Facility Id:	U0013486
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	11/15/1987
UST Inspection Date:	02/25/1991
UST Tank Test Date:	01/16/1993
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	7532
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

S154 **FEDERAL COURTHOUSE - SACRAMENTO** **CA DEED** **S106568278**
SE **5TH AND I STREETS** **CA VCP** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814** **CA ENVIROSTOR**
0.153 mi.
810 ft. **Site 4 of 14 in cluster S**

Relative:
Higher

Actual:
31 ft.

DEED:

Envirostor ID:	34750040
Area:	PROJECT WIDE
Sub Area:	Not reported
Site Type:	VOLUNTARY CLEANUP
Status:	CERTIFIED O&M - LAND USE RESTRICTIONS ONLY
Agency:	Not reported
Covenant Uploaded:	Not reported
Deed Date(s):	07/19/1995

VCP:

Facility ID:	34750040
Site Type:	Voluntary Cleanup
Site Type Detail:	Voluntary Cleanup
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	3
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP, RWQCB 5R - Central Valley
Lead Agency:	NONE SPECIFIED
Lead Agency Description:	Not reported
Project Manager:	Ruth Cayabyab
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Site Code:	100365
Assembly:	07
Senate:	06
Special Programs Code:	Voluntary Cleanup Program
Status:	Certified O&M - Land Use Restrictions Only

FEDERAL COURTHOUSE - SACRAMENTO (Continued) **S106568278**

Status Date:	06/28/1996
Restricted Use:	YES
Funding:	Responsible Party
Lat/Long:	38.58305 / -121.4991
APN:	NONE SPECIFIED
Past Use:	RAIL ROAD MAINTENANCE SHOP
Potential COC:	10002, 10097, 10196
Confirmed COC:	NONE SPECIFIED
Potential Description:	SOIL
Alias Name:	SP-SACTO COURTHOUSE
Alias Type:	Alternate Name
Alias Name:	110033615318
Alias Type:	EPA (FRS #)
Alias Name:	100365
Alias Type:	Project Code (Site Code)
Alias Name:	34750040
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Removal Action Completion Report
Completed Date:	06/27/1996
Comments:	RA -- The property includes a small triangle of Southern Pacific Railroad property which was remediated and Certi- fied as part of the Sacramento Station Study Area. The remainder of the property, which is the subject of this Certification, was owned by the City of Sacramento. The City portion of the property was used as a vehicle park- ing, fueling, maintenance and repair facility for the Sacramento City Police Dept. Underground waste oil, motor oil, and antifreeze tanks were removed in early 1995 from the site under Sacramento County Underground Tank Program oversight. The property contained fill material from unknown sources. Soils were impacted by petroleum hydrocarbons, polycyclic aromatic hydrocarbons, and lead. Contaminated soils were excavated and trans- ported to a Class I or Class II landfill, as appropriate. Construction of a new federal courthouse is currently underway at the remediated site. 3.0 acres of land returned/released for reuse; 8,748 cu yds disposed to landfill.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Removal Action Workplan
Completed Date:	04/30/1994
Comments:	RI/FS -- The City of Sacramento has conducted soil and groundwater investigation on their portion of the Courthouse property. The City has committed to taking soil excavated as part of construction to a Class III landfill, except soil found above established remediation standards. An area of soil contaminated with PAHs will be remediated. Groundwater extracted as part of construction will be treated, filtered and discharged to the storm/sanitary sewer system. (RP funded)

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Certification
Completed Date:	06/28/1996
Comments:	CERT -- See comments under 6/27/96.

FEDERAL COURTHOUSE - SACRAMENTO (Continued) **S106568278**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 07/19/1995
Comments: Deed Restriction restricts owners and occupants from extracting, consuming exposing or utilizing in any way groundwater prior to the Department's approval. The deed restriction also prevents hinderence with equipment associated with the groundwater monitoring and treatment systems.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 06/14/1995
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 08/02/1993
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 10/18/1996
Comments: VCONS -- The property includes a small triange of Southern Pacific Railroad property which was remediated and certified as part of the Sacramento Station Study Area. The remainder of the property, which is the subject of this certification, was owned by the City of Sacramento. The City portion of the property was used as a vehicle parking, fueling, maintenance and repair facility for the Sacramento City Police Department. Underground waste oil, motor oil, and antifreeze tanks were removed in early 1995 from the site under Sacramento County Underground Tank Program oversight. The property contained fill material from unknown sources. Soils were impacted by petroleum hydrocarbons, polycyclic aromatic hydrocarbons, and lead. Contaminated soils were excavated and transported to a Class II or III landfill, as appropriate. Construction of a new federal courthouse is currently underway at the remediated site. The work was carried out under a Voluntary Cleanup Program (VCP) Agreement, Agreement #94-182. The project is now considered complete. In July 1995 a Deed Restriction (DR) was recorded w/Sacramento County. The DR prohibits extraction or use of groundwater and excavation of any soil without prior DTSC approval. Additionally, use of the land for farming, hospitals, schools, or for residential land use is prohibited. On August 29, 1995 contruction of the Federal Courthouse officially began. The $142 million dollar 380,000 square foot building will produce more than 1,000 new construction jobs and 200 permanent jobs. The Federal Courthouse is the first new federal building to be built in the City of Sacramento since 1961 and is the single biggest construction project in the City of Sacramento's history.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported

FEDERAL COURTHOUSE - SACRAMENTO (Continued) **S106568278**

Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

ENVIROSTOR:
Facility ID: 34750040
Status: Certified O&M - Land Use Restrictions Only
Status Date: 06/28/1996
Site Code: 100365
Site Type: Voluntary Cleanup
Site Type Detailed: Voluntary Cleanup
Acres: 3
NPL: NO
Regulatory Agencies: SMBRP, RWQCB 5R - Central Valley
Lead Agency: NONE SPECIFIED
Program Manager: Ruth Cayabyab
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Voluntary Cleanup Program
Restricted Use: YES
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.58305
Longitude: -121.4991
APN: NONE SPECIFIED
Past Use: RAIL ROAD MAINTENANCE SHOP
Potential COC: * HALOGENATED ORGANIC COMPOUNDS * CONTAMINATED SOIL * UNSPECIFIED OIL CONTAINING WASTE
Confirmed COC: NONE SPECIFIED
Potential Description: SOIL
Alias Name: SP-SACTO COURTHOUSE
Alias Type: Alternate Name
Alias Name: 110033615318
Alias Type: EPA (FRS #)
Alias Name: 100365
Alias Type: Project Code (Site Code)
Alias Name: 34750040
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 06/27/1996
Comments: RA -- The property includes a small triangle of Southern Pacific Railroad property which was remediated and Certi- fied as part of the Sacramento Station Study Area. The remainder of the property, which is the subject of this Certification, was owned by the City of Sacramento. The City portion of the property was used as a vehicle park- ing, fueling, maintenance and repair facility for the Sacramento City Police Dept. Underground waste oil, motor oil, and antifreeze tanks were removed in early 1995 from the site under

FEDERAL COURTHOUSE - SACRAMENTO (Continued) **S106568278**

Sacramento County Underground Tank Program oversight. The property contained fill material from unknown sources. Soils were impacted by petroleum hydrocarbons, polycyclic aromatic hydrocarbons, and lead. Contaminated soils were excavated and trans- ported to a Class I or Class II landfill, as appropriate. Construction of a new federal courthouse is currently underway at the remediated site. 3.0 acres of land returned/released for reuse; 8,748 cu yds disposed to landfill.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 04/30/1994
Comments: RI/FS -- The City of Sacramento has conducted soil and groundwater investigation on their portion of the Courthouse property. The City has committed to taking soil excavated as part of construction to a Class III landfill, except soil found above established remediation standards. An area of soil contaminated with PAHs will be remediated. Groundwater extracted as part of construction will be treated, filtered and discharged to the storm/sanitary sewer system. (RP funded)

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 06/28/1996
Comments: CERT -- See comments under 6/27/96.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 07/19/1995
Comments: Deed Restriction restricts owners and occupants from extracting, consuming exposing or utilizing in any way groundwater prior to the Department's approval. The deed restriction also prevents hinderence with equipment associated with the groundwater monitoring and treatment systems.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 06/14/1995
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 08/02/1993
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 10/18/1996
Comments: VCONS -- The property includes a small triange of Southern Pacific Railroad property which was remediated and certified as part of the Sacramento Station Study Area. The remainder of the property, which is the subject of this certification, was owned by the City of

FEDERAL COURTHOUSE - SACRAMENTO (Continued) **S106568278**

Sacramento. The City portion of the property was used as a vehicle parking, fueling, maintenance and repair facility for the Sacramento City Police Department. Underground waste oil, motor oil, and antifreeze tanks were removed in early 1995 from the site under Sacramento County Underground Tank Program oversight. The property contained fill material from unknown sources. Soils were impacted by petroleum hydrocarbons, polycyclic aromatic hydrocarbons, and lead. Contaminated soils were excavated and transported to a Class II or III landfill, as appropriate. Construction of a new federal courthouse is currently underway at the remediated site. The work was carried out under a Voluntary Cleanup Program (VCP) Agreement, Agreement #94-182. The project is now considered complete. In July 1995 a Deed Restriction (DR) was recorded w/Sacramento County. The DR prohibits extraction or use of groundwater and excavation of any soil without prior DTSC approval. Additionally, use of the land for farming, hospitals, schools, or for residential land use is prohibited. On August 29, 1995 contruction of the Federal Courthouse officially began. The $142 million dollar 380,000 square foot building will produce more than 1,000 new construction jobs and 200 permanent jobs. The Federal Courthouse is the first new federal building to be built in the City of Sacramento since 1961 and is the single biggest construction project in the City of Sacramento's history.

Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

S155 **FEDERAL COURTHOUSE - SACR** **CA HIST CORTESE** **S100539092**
SE **5TH AND I ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.153 mi.
810 ft. **Site 5 of 14 in cluster S**

Relative:
Higher

Actual:
31 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	CALSI
Reg Id:	34750040

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156 **YANCEY FRED** **EDR US Hist Auto Stat** **1009023694**
SW **308 F ST** **N/A**
1/8-1/4 **BRODERICK, CA**
0.155 mi.
816 ft.

Relative:
Higher

Actual:
23 ft.

EDR Historical Auto Stations:

Name:	YANCEY FRED
Year:	1942
Type:	AUTOMOBILE REPAIRING

S157 **ROBERT T. MATSUI US COURTHOUSE** **CA Sacramento Co. ML** **S107770010**
SE **501 I ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.155 mi.
821 ft. **Site 6 of 14 in cluster S**

Relative:
Higher

Actual:
31 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	A
Billing Codes UST:	Not reported
WG Bill Code:	I
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

S158 **LOTUS LAUNDRY** **EDR US Hist Cleaners** **1009145719**
SE **918 5TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.156 mi.
826 ft. **Site 7 of 14 in cluster S**

Relative:
Higher

Actual:
31 ft.

EDR Historical Cleaners:

Name:	LOTUS LAUNDRY
Year:	1956
Type:	LAUNDRIES

Q159 **FONG LEE** **EDR US Hist Cleaners** **1009144309**
SSE **1106 4TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.157 mi.
827 ft. **Site 16 of 17 in cluster Q**

Relative:
Higher

Actual:
26 ft.

EDR Historical Cleaners:

Name:	FONG LEE
Year:	1937
Type:	LAUNDRIES-CHINESE
Name:	FONG LEE
Year:	1942
Type:	LAUNDRIES-ORIENTAL

Q160 **CECCARELLI LOUIS** **EDR US Hist Auto Stat** **1009023174**
SSE **1108 4TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.157 mi.
828 ft. **Site 17 of 17 in cluster Q**

Relative: Higher
Actual: 26 ft.

EDR Historical Auto Stations:
Name: CECCARELLI LOUIS
Year: 1952
Type: AUTOMOBILE GARAGES

S161 **COMMERCIAL GARAGE REAR** **EDR US Hist Auto Stat** **1009022268**
SE **915 5TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.157 mi.
830 ft. **Site 8 of 14 in cluster S**

Relative: Higher
Actual: 31 ft.

EDR Historical Auto Stations:
Name: COMMERCIAL GARAGE REAR
Year: 1956
Type: AUTOMOBILE REPAIRING

S162 **MYRICK A L** **EDR US Hist Cleaners** **1009144698**
SE **504 I ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.159 mi.
838 ft. **Site 9 of 14 in cluster S**

Relative: Higher
Actual: 31 ft.

EDR Historical Cleaners:
Name: MYRICK A L
Year: 1923
Type: CLEANERS AND DYERS

Name: MYRICK A L
Year: 1923
Type: CLEANERS AND DYERS

Name: MYRICK A L
Year: 1928
Type: CLEANERS AND DYERS

Name: MYRICK A L
Year: 1928
Type: CLEANERS AND DYERS

P163 **GOLD STAR LAUNDRY** **EDR US Hist Cleaners** **1009148020**
SSE **1027 2ND ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.161 mi.
851 ft. **Site 8 of 11 in cluster P**

Relative: Higher
Actual: 24 ft.

EDR Historical Cleaners:
Name: GOLD STAR LAUNDRY
Year: 1956
Type: LAUNDRIES

P164 **FONG WEE** **EDR US Hist Cleaners** **1009145206**
SSE **1026 2ND ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.161 mi.
852 ft. **Site 9 of 11 in cluster P**

Relative:
Higher

Actual:
24 ft.

EDR Historical Cleaners:

Name:	YOCUM J M
Year:	1920
Type:	CLEANERS AND DYERS
Name:	BOW JOEW
Year:	1937
Type:	LAUNDRIES-CHINESE
Name:	FONG WEE
Year:	1942
Type:	LAUNDRIES-ORIENTAL

P165 **O'GRADY'S OLD TIME PHOTOS** **CA Sacramento Co. ML** **S102445803**
SSE **1026 2ND ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.161 mi.
852 ft. **Site 10 of 11 in cluster P**

Relative:
Higher

Actual:
24 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	Not reported
Billing Codes UST:	Not reported
WG Bill Code:	I
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

P166 **YOCUM J M** **EDR US Hist Cleaners** **1009145559**
SSE **1028 2ND ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.162 mi.
857 ft. **Site 11 of 11 in cluster P**

Relative:
Higher

Actual:
24 ft.

EDR Historical Cleaners:

Name:	YOCUM J M
Year:	1923
Type:	CLEANERS AND DYERS

YOCUM J M (Continued) **1009145559**

Name: YOCUM J M
Year: 1923
Type: CLEANERS AND DYERS

Name: YOCUM J M
Year: 1928
Type: CLEANERS AND DYERS

Name: YOCUM J M
Year: 1928
Type: CLEANERS AND DYERS

T167 **HOLIDAY INN CAPITOL PLAZA** **CA Sacramento Co. ML** **S103707589**
SSE **300 J ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.165 mi.
872 ft. **Site 1 of 2 in cluster T**

Relative: Higher

Actual: 27 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	A
Billing Codes UST:	Not reported
WG Bill Code:	Not reported
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

---

168 **JIBBOOM JUNKYARD** **CA BOND EXP. PLAN** **S100833429**
North **I-5 AND JIBBOOM STREET** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.167 mi.
884 ft.

Relative: Higher

Actual: 17 ft.

CA BOND EXP. PLAN:

Reponsible Party:	NPL SITE CLEANUP WORKPLAN
Project Revenue Source Company:	Not reported
Project Revenue Source Addr:	Not reported
Project Revenue Source City,St,Zip:	Not reported
Project Revenue Source Desc:	The site is on the NPL and remedial actions are jointly funded by the State (10 percent) and federal (90 percent) governments. Bond monies were used to fund the State's share of the remedial action. The State and federal governments will seek cost recovery from any identified responsible parties.

JIBBOOM JUNKYARD (Continued) **S100833429**

Site Description: This is a former junkyard/transformer salvage yard. It is on the Sacramento River south of the confluence with the American River.

Hazardous Waste Desc: Polychlorinated biphenyls (PCBs), lead, copper, zinc and asbestos were found in soils at this site.

Threat To Public Health & Env: People coming in direct contact with contaminated soils from the site were the population at risk. The routes of exposure were dermal, inhalation, and ingestion. Approximately 11,000 cubic yards of contaminated soil were removed from this 2.3 acre site. The depth of excavation ranged from 1 foot to 30 feet below grade.

Site Activity Status: A draft feasibility study prepared under an EPA contract, was submitted in February, 1985. The final design analysis was completed in July, 1985. Remedial action was completed in May, 1987. The site is pending certification by EPA.

S169 **SELLINGER G P** **EDR US Hist Auto Stat** **1009019961**
SE **521 I ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.170 mi.
897 ft. **Site 10 of 14 in cluster S**

Relative: **Higher**

Actual: **31 ft.**

EDR Historical Auto Stations:

Name: SELLINGER G P
Year: 1928
Type: AUTOMOBILE GARAGES

Name: SELLINGER G P
Year: 1928
Type: AUTOMOBILE GARAGES

S170 **DAL PORTO DOMENIC** **EDR US Hist Auto Stat** **1009019699**
SE **523 I ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.171 mi.
904 ft. **Site 11 of 14 in cluster S**

Relative: **Higher**

Actual: **31 ft.**

EDR Historical Auto Stations:

Name: DAL PORTO DOMENIC
Year: 1933
Type: AUTOMOBILE REPAIRING

S171 **DAL PORTO DOMINIC** **EDR US Hist Auto Stat** **1009020064**
SE **522 I ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.172 mi.
906 ft. **Site 12 of 14 in cluster S**

Relative: **Higher**

Actual: **31 ft.**

EDR Historical Auto Stations:

Name: DAL PORTO DOMINIC
Year: 1937
Type: AUTOMOBILE REPAIRING

Name: DAL PORTO DOMINIC
Year: 1942
Type: AUTOMOBILE REPAIRING

S172 **THOMPSON S CHEVRON SERVICE** **EDR US Hist Auto Stat** **1009022749**
SE **531 I STREET** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.177 mi.
934 ft. **Site 13 of 14 in cluster S**

Relative:
Higher

Actual:
31 ft.

EDR Historical Auto Stations:

Name:	THOMPSON S CHEVRON SERVICE
Year:	1966
Type:	GASOLINE STATIONS

S173 **ALPHA GRAPHICS PRINTSHOPS** **CA Sacramento Co. ML** **S111711674**
SE **530 I ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.177 mi.
936 ft. **Site 14 of 14 in cluster S**

Relative:
Higher

Actual:
31 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	2759
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

U174 **ALPHA GRAPHICS** **CA Sacramento Co. ML** **S104795891**
SE **501 J ST 100** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.185 mi.
976 ft. **Site 1 of 11 in cluster U**

Relative:
Higher

Actual:
28 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	Not reported
Billing Codes UST:	Not reported
WG Bill Code:	I
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported

ALPHA GRAPHICS (Continued) **S104795891**

Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

U175 **SUTTER PRINTING** **CA Sacramento Co. ML** **S103707590**
SE **501 J ST** **CA HAZNET** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.185 mi.
976 ft. **Site 2 of 11 in cluster U**

Relative:
Higher

Actual:
28 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	Not reported
Billing Codes UST:	Not reported
WG Bill Code:	I
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

HAZNET:

envid:	S103707590
Year:	2013
GEPAID:	CAC002729370
Contact:	DUSTIN KEEN
Telephone:	9168524266
Mailing Name:	Not reported
Mailing Address:	2489 MERCANTILE DR
Mailing City,St,Zip:	RANCHO CORDOVA, CA 95742
Gen County:	Sacramento
TSD EPA ID:	NVT330010000
TSD County:	99
Waste Category:	Not reported
Disposal Method:	Other Recovery Of Reclamation For Reuse Including Acid Regeneration, Organics Recovery Ect
Tons:	0.2
Facility County:	Not reported

V176 **CHONG HOP** **EDR US Hist Cleaners** **1009147701**
South **121 K ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.185 mi.
977 ft. **Site 1 of 4 in cluster V**

Relative:
Higher

Actual:
24 ft.

EDR Historical Cleaners:

Name:	HOP CHONG
Year:	1928
Type:	LAUNDRIES-CHINESE
Name:	HOP CHONG
Year:	1928
Type:	LAUNDRIES-CHINESE
Name:	HOP CHONG
Year:	1933
Type:	LAUNDRIES CHINESE
Name:	CHONG HOP
Year:	1937
Type:	LAUNDRIES-CHINESE

U177 **BROWN J L** **EDR US Hist Cleaners** **1009143359**
SE **1004 5TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.187 mi.
986 ft. **Site 3 of 11 in cluster U**

Relative:
Higher

Actual:
28 ft.

EDR Historical Cleaners:

Name:	BROWN J L
Year:	1933
Type:	CLOTHES PRESSERS AND CLEANERS

U178 **GEE LAUNDRY** **EDR US Hist Cleaners** **1009148019**
SE **504 J ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.190 mi.
1002 ft. **Site 4 of 11 in cluster U**

Relative:
Higher

Actual:
28 ft.

EDR Historical Cleaners:

Name:	GEE LAUNDRY
Year:	1956
Type:	LAUNDRIES

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179 **EDR US Hist Cleaners** **1015074470**
WSW **550 7TH ST** **N/A**
1/8-1/4 **WEST SACRAMENTO, CA 95605**
0.191 mi.
1009 ft.

Relative:
Higher

Actual:
23 ft.

EDR Historical Cleaners:

Name:	ALEX CLEANING SERVICES
Year:	2005
Address:	550 7TH ST

W180
West
1/8-1/4
0.191 mi.
1009 ft.

TURNER LAND COMPANY PROPERT
800 SACRAMENTO AVENUE
WEST SACRAMENTO, CA 95691

CA LUST **S108997006**
N/A

Site 1 of 2 in cluster W

Relative:
Higher

Actual:
26 ft.

LUST REG 5:

Region:	5
Status:	Pollution Characterization
Case Number:	570339
Case Type:	Other ground water affected
Substance:	Not reported
Staff Initials:	DFS
Lead Agency:	Regional
Program:	LUST
MTBE Code:	N/A

W181
West
1/8-1/4
0.191 mi.
1009 ft.

TURNER LAND COMPANY PROPERTY (FORMERLY 800 SACRAMENTO AVE.)
8TH AND SACRAMENTO AVENUE
WEST SACRAMENTO, CA 95691

CA LUST **S110655968**
N/A

Site 2 of 2 in cluster W

Relative:
Higher

Actual:
26 ft.

LUST:

Region:	STATE
Global Id:	T0611318234
Latitude:	38.5884533333333
Longitude:	-121.517236666667
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	05/04/2010
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	DFS
Local Agency:	YOLO COUNTY
RB Case Number:	570339
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	Gasoline, Diesel
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0611318234
Contact Type:	Local Agency Caseworker
Contact Name:	JEFF PINNOW
Organization Name:	YOLO COUNTY
Address:	137 N. COTTONWOOD STREET, SUITE 2400
City:	WOODLAND
Email:	jpinnow@yolocounty.org
Phone Number:	Not reported

Global Id:	T0611318234
Contact Type:	Regional Board Caseworker
Contact Name:	DAVID STAVAREK
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	dstavarek@waterboards.ca.gov

TURNER LAND COMPANY PROPERTY (FORMERLY 800 SACRAMENTO AVE.) (Continued) **S110655968**

Phone Number: Not reported

Status History:
Global Id: T0611318234
Status: Open - Site Assessment
Status Date: 01/09/2007

Global Id: T0611318234
Status: Open - Site Assessment
Status Date: 04/22/2008

Global Id: T0611318234
Status: Completed - Case Closed
Status Date: 05/04/2010

Global Id: T0611318234
Status: Open - Case Begin Date
Status Date: 11/16/2006

Global Id: T0611318234
Status: Open - Remediation
Status Date: 01/21/2010

Regulatory Activities:
Global Id: T0611318234
Action Type: ENFORCEMENT
Date: 04/20/2010
Action: Staff Letter

Global Id: T0611318234
Action Type: ENFORCEMENT
Date: 05/05/2010
Action: Closure/No Further Action Letter

Global Id: T0611318234
Action Type: Other
Date: 01/01/2006
Action: Leak Began

Global Id: T0611318234
Action Type: REMEDIATION
Date: 05/15/2008
Action: Monitored Natural Attenuation

Global Id: T0611318234
Action Type: Other
Date: 11/16/2006
Action: Leak Discovery

Global Id: T0611318234
Action Type: ENFORCEMENT
Date: 02/11/2008
Action: Staff Letter

Global Id: T0611318234
Action Type: ENFORCEMENT

TURNER LAND COMPANY PROPERTY (FORMERLY 800 SACRAMENTO AVE.) (Continued) **S110655968**

Date: 03/27/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0611318234
Action Type: ENFORCEMENT
Date: 04/29/2008
Action: Staff Letter

Global Id: T0611318234
Action Type: ENFORCEMENT
Date: 03/20/2012
Action: Staff Letter

Global Id: T0611318234
Action Type: ENFORCEMENT
Date: 04/29/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611318234
Action Type: ENFORCEMENT
Date: 09/11/2008
Action: Staff Letter

Global Id: T0611318234
Action Type: ENFORCEMENT
Date: 04/28/2008
Action: Verbal Communication

Global Id: T0611318234
Action Type: Other
Date: 01/09/2007
Action: Leak Reported

Global Id: T0611318234
Action Type: RESPONSE
Date: 11/11/2008
Action: Correspondence

Global Id: T0611318234
Action Type: ENFORCEMENT
Date: 08/11/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611318234
Action Type: RESPONSE
Date: 10/31/2008
Action: Monitoring Report - Quarterly

Global Id: T0611318234
Action Type: RESPONSE
Date: 07/25/2008
Action: Soil and Water Investigation Report

Global Id: T0611318234
Action Type: RESPONSE
Date: 06/15/2009
Action: Correspondence

TURNER LAND COMPANY PROPERTY (FORMERLY 800 SACRAMENTO AVE.) (Continued) **S110655968**

Global Id: T0611318234
Action Type: RESPONSE
Date: 08/17/2009
Action: Correspondence

Global Id: T0611318234
Action Type: RESPONSE
Date: 07/23/2009
Action: Request for Closure

Global Id: T0611318234
Action Type: RESPONSE
Date: 04/25/2008
Action: Soil and Water Investigation Workplan

Global Id: T0611318234
Action Type: ENFORCEMENT
Date: 07/27/2009
Action: Staff Letter

Global Id: T0611318234
Action Type: RESPONSE
Date: 04/08/2009
Action: Verbal Communication

Global Id: T0611318234
Action Type: RESPONSE
Date: 10/31/2009
Action: Monitoring Report - Quarterly

Global Id: T0611318234
Action Type: ENFORCEMENT
Date: 02/25/2010
Action: Staff Letter

Global Id: T0611318234
Action Type: ENFORCEMENT
Date: 01/21/2010
Action: Technical Correspondence / Assistance / Other

Global Id: T0611318234
Action Type: ENFORCEMENT
Date: 01/20/2010
Action: Staff Letter

Global Id: T0611318234
Action Type: ENFORCEMENT
Date: 03/01/2010
Action: Staff Letter

Global Id: T0611318234
Action Type: RESPONSE
Date: 11/04/2008
Action: Verbal Communication

Global Id: T0611318234
Action Type: RESPONSE

TURNER LAND COMPANY PROPERTY (FORMERLY 800 SACRAMENTO AVE.) (Continued) **S110655968**

Date: 01/31/2009
Action: Monitoring Report - Quarterly

Global Id: T0611318234
Action Type: RESPONSE
Date: 04/30/2009
Action: Monitoring Report - Quarterly

Global Id: T0611318234
Action Type: RESPONSE
Date: 11/02/2009
Action: Verbal Communication

Global Id: T0611318234
Action Type: RESPONSE
Date: 04/20/2009
Action: Correspondence

Global Id: T0611318234
Action Type: RESPONSE
Date: 12/07/2009
Action: Correspondence

Global Id: T0611318234
Action Type: RESPONSE
Date: 04/13/2009
Action: Correspondence

U182 **ACME CLEANERS AND LAUNDRY** **EDR US Hist Cleaners** **1009145185**
SE **1011 5TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.191 mi.
1011 ft. **Site 5 of 11 in cluster U**

Relative:
Higher

Actual:
28 ft.

EDR Historical Cleaners:
Name: ACME CLEANERS AND LAUNDRY
Year: 1942
Type: LAUNDRIES-ORIENTAL

Name: ACME CLEANERS AND LAUNDRY
Year: 1942
Type: CLOTHES PRESSERS AND CLEANERS

V183 **SHIMOTORI MINAO** **EDR US Hist Cleaners** **1009144330**
South **205 K ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.192 mi.
1014 ft. **Site 2 of 4 in cluster V**

Relative:
Higher

Actual:
24 ft.

EDR Historical Cleaners:
Name: SHIMOTORI MINAO
Year: 1942
Type: LAUNDRIES-ORIENTAL

U184 **VETERANS CLEANERS** **EDR US Hist Cleaners** **1009146294**
SE **511 J STREET** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.192 mi.
1016 ft. **Site 6 of 11 in cluster U**

Relative:
Higher

Actual:
28 ft.

EDR Historical Cleaners:

Name:	VETERANS CLEANERS
Year:	1952
Type:	CLEANERS AND DYERS
Name:	VETERANS CLEANERS
Year:	1966
Type:	CLEANERS AND DYERS

V185 **FORT SUTTER LAUNDERLAND** **EDR US Hist Cleaners** **1009145991**
South **243 K STREET** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.192 mi.
1016 ft. **Site 3 of 4 in cluster V**

Relative:
Higher

Actual:
25 ft.

EDR Historical Cleaners:

Name:	FORT SUTTER LAUNDERLAND
Year:	1980
Type:	LAUNDRIES AND DRY CLEANERS

T186 **MILLER JOHN** **EDR US Hist Cleaners** **1009145144**
SSE **307 K ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.193 mi.
1020 ft. **Site 2 of 2 in cluster T**

Relative:
Higher

Actual:
27 ft.

EDR Historical Cleaners:

Name:	PEERLESS
Year:	1923
Type:	CLEANERS AND DYERS
Name:	PEERLESS
Year:	1923
Type:	CLEANERS AND DYERS
Name:	MILLER JOHN
Year:	1933
Type:	CLOTHES PRESSERS AND CLEANERS
Name:	MILLER J M
Year:	1937
Type:	CLOTHES PRESSERS AND CLEANERS

U187 **OCK LEE HAND LAUNDRY** **EDR US Hist Cleaners** **1009148120**
SE **1021 5TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.197 mi.
1041 ft. **Site 7 of 11 in cluster U**

Relative:
Higher

Actual:
27 ft.

EDR Historical Cleaners:

Name:	AH LUN
Year:	1933
Type:	LAUNDRIES CHINESE
Name:	AH LUN
Year:	1937
Type:	LAUNDRIES-CHINESE
Name:	AH LUN
Year:	1942
Type:	LAUNDRIES-ORIENTAL
Name:	OCK LEE HAND LAUNDRY
Year:	1956
Type:	LAUNDRIES

U188 **SPOTLESS CLEANERS** **EDR US Hist Cleaners** **1009145186**
SE **1023 5TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.198 mi.
1047 ft. **Site 8 of 11 in cluster U**

Relative:
Higher

Actual:
27 ft.

EDR Historical Cleaners:

Name:	ROYAL CLEANERS
Year:	1937
Type:	HAT CLEANERS AND BLOCKERS
Name:	ARTENIAN GEO
Year:	1942
Type:	CLOTHES PRESSERS AND CLEANERS
Name:	SPOTLESS CLEANERS
Year:	1952
Type:	CLEANERS AND DYERS

U189 **COHN HARRY** **EDR US Hist Cleaners** **1009146463**
SE **522 J ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.201 mi.
1059 ft. **Site 9 of 11 in cluster U**

Relative:
Higher

Actual:
28 ft.

EDR Historical Cleaners:

Name:	COHN HARRY
Year:	1942
Type:	CLOTHES PRESSERS AND CLEANERS

U190 **FONG SING HAND LAUNDRY** **EDR US Hist Cleaners** **1009145432**
SE **527 J STREET** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.202 mi.
1067 ft. **Site 10 of 11 in cluster U**

Relative:
Higher

Actual:
29 ft.

EDR Historical Cleaners:

Name:	FONG SING HAND LAUNDRY
Year:	1956
Type:	LAUNDRIES
Name:	FONG SING HAND LAUNDRY
Year:	1966
Type:	LAUNDRIES

V191 **MCGEE'S OLD TIME PHOTOS** **CA Sacramento Co. ML** **S102315197**
South **1107 FRONT ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.203 mi.
1071 ft. **Site 4 of 4 in cluster V**

Relative:
Higher

Actual:
22 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	Not reported
Billing Codes UST:	Not reported
WG Bill Code:	I
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

X192 **GOLDEN DRAGON RESTAURANT** **CA Sacramento Co. ML** **S105269361**
South **1115 FRONT ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.209 mi.
1103 ft. **Site 1 of 2 in cluster X**

Relative:
Higher

Actual:
22 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Disclaimer
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	50

GOLDEN DRAGON RESTAURANT (Continued) **S105269361**

Food Bill Code:	50
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

X193 **DAY'S OF 49** **CA Sacramento Co. ML** **S105269362**
South **1115 FRONT ST #11** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.209 mi.
1103 ft. **Site 2 of 2 in cluster X**

Relative:
Higher

Actual:
22 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

---

194 **EAGLE CLEANERS** **EDR US Hist Cleaners** **1009145181**
SSE **1125 3RD ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.210 mi.
1107 ft.

Relative:
Higher

Actual:
27 ft.

EDR Historical Cleaners:

Name:	EAGLE CLEANERS
Year:	1928
Type:	CLEANERS AND DYERS
Name:	EAGLE CLEANERS

EAGLE CLEANERS (Continued) **1009145181**

Year: 1928
Type: CLEANERS AND DYERS

Name: YOSHIDA G
Year: 1933
Type: CLOTHES PRESSERS AND CLEANERS

Name: YOSHIDA GORO
Year: 1937
Type: CLOTHES PRESSERS AND CLEANERS

Name: YOSHIDA GORO
Year: 1942
Type: CLOTHES PRESSERS AND CLEANERS

Y195 **MACY'S** **CA Sacramento Co. ML** **S111711790**
SSE **414 K ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.213 mi.
1126 ft. **Site 1 of 4 in cluster Y**

Relative:
Higher

Actual:
28 ft.

Sacramento Co. ML:
Facility Id: Not reported
Facility Status: Inactive. Included on a listing no longer updated.
FD: U
Billing Codes BP: Disclaimer
Billing Codes UST: No Tanks
WG Bill Code: Oil Changed by Outside Company-No Fee
Target Property Bill Cod: 50
Food Bill Code: 50
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: Not reported
UST Permit Dt: Not reported
UST Inspection Date: Not reported
UST Tank Test Date: Not reported
Number of Tanks: 0
UST Tank Test Date: Not reported
SIC Code: Not reported
Tier Permitting: Not reported
AST Bill Code: Not reported
CALARP Bill Code: Not reported

Facility Id: Not reported
Facility Status: Not reported
FD: Not reported
Billing Codes BP: A
Billing Codes UST: Not reported
WG Bill Code: A
Target Property Bill Cod: Not reported
Food Bill Code: Not reported
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: Not reported
UST Permit Dt: Not reported
UST Inspection Date: Not reported

MACY'S (Continued) **S111711790**

UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

Y196 **NICHOLOPOULOS K A** **EDR US Hist Cleaners** **1009147811**
SSE **423 K ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.214 mi.
1130 ft. **Site 2 of 4 in cluster Y**

Relative:
Higher

Actual:
28 ft.

EDR Historical Cleaners:

Name:	BERKOS GEO
Year:	1928
Type:	HAT CLEANERS AND BLOCKERS
Name:	BERKOS GEO
Year:	1928
Type:	HAT CLEANERS AND BLOCKERS
Name:	NICHOLOPOULOS K A
Year:	1933
Type:	HAT CLEANERS AND BLOCKERS
Name:	NICHOLOPOULOS K A
Year:	1937
Type:	HAT CLEANERS AND BLOCKERS
Name:	NICHOLOPOULOS K A
Year:	1942
Type:	HAT CLEANERS AND BLOCKERS
Name:	AMERICAN HAT WORKS
Year:	1956
Type:	HAT CLEANERS AND BLOCKERS

Y197 **PAPPAS LOUIS** **EDR US Hist Cleaners** **1009148119**
SSE **422 K ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.216 mi.
1139 ft. **Site 3 of 4 in cluster Y**

Relative:
Higher

Actual:
28 ft.

EDR Historical Cleaners:

Name:	PAPPAS LOUIS
Year:	1937
Type:	HAT CLEANERS AND BLOCKERS

Y198 **BOYLE BROS** **EDR US Hist Cleaners** **1009145550**
SSE **429 K ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.216 mi.
1139 ft. **Site 4 of 4 in cluster Y**

Relative:
Higher

Actual:
28 ft.

EDR Historical Cleaners:
Name: BOYLE BROS
Year: 1920
Type: CLEANERS AND DYERS

Z199 **GRAIWER PROPERTY** **CA SLIC** **S106230584**
WSW **E, F, 7TH & 8TH STS (BOUNDED BY)** **N/A**
1/8-1/4 **WEST SACRAMENTO, CA**
0.216 mi.
1143 ft. **Site 1 of 5 in cluster Z**

Relative:
Higher

Actual:
23 ft.

SLIC REG 5:
Region: 5
Facility Status: Phase Two Remedial Investigation
Unit: Facility is a Spill or site
Pollutant: TPH
Lead Agency: Not reported
Date Filed: / /
Report Date: 08/24/89
Date Added: Not reported
Date Closed: Not reported

U200 **STATE OF CA DEPT OF FOOD AND AG** **CA Sacramento Co. ML** **S106387879**
SE **560 J ST 170-B** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.224 mi.
1184 ft. **Site 11 of 11 in cluster U**

Relative:
Higher

Actual:
29 ft.

Sacramento Co. ML:
Facility Id: Not reported
Facility Status: Not reported
FD: Not reported
Billing Codes BP: I
Billing Codes UST: Not reported
WG Bill Code: I
Target Property Bill Cod: Not reported
Food Bill Code: Not reported
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: Not reported
UST Permit Dt: Not reported
UST Inspection Date: Not reported
UST Tank Test Date: Not reported
Number of Tanks: Not reported
UST Tank Test Date: Not reported
SIC Code: Not reported
Tier Permitting: Not reported
AST Bill Code: Not reported
CALARP Bill Code: Not reported

AA201 **FIRST UNION BANK C O JONES LANG LASALLE** **RCRA-SQG** **1005441125**
SW **707 3RD ST** **CA HAZNET** **CAR000115766**
1/8-1/4 **W SACRAMENTO, CA 95605** **CA EMI**
0.225 mi.
1186 ft. **Site 1 of 3 in cluster AA**

Relative:
Higher

Actual:
25 ft.

RCRA-SQG:

Date form received by agency:	05/03/2002
Facility name:	FIRST UNION BANK C O JONES LANG LASALLE
Facility address:	707 3RD ST W SACRAMENTO, CA 95605
EPA ID:	CAR000115766
Contact:	LARRY COLBERT
Contact address:	707 3RD ST W SACRAMENTO, CA 95605
Contact country:	US
Contact telephone:	(916) 374-9133
Contact email:	Not reported
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	F U N B C O JONES L LASALLE
Owner/operator address:	707 3RD ST W SACRAMENTO, CA 95605
Owner/operator country:	Not reported
Owner/operator telephone:	(916) 344-9133
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002

FIRST UNION BANK C O JONES LANG LASALLE (Continued) **1005441125**

. Waste name: CORROSIVE WASTE

. Waste code: D035
. Waste name: METHYL ETHYL KETONE

. Waste code: F001
. Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS USED IN DEGREASING: TETRACHLOROETHYLENE, TRICHLORETHYLENE, METHYLENE CHLORIDE, 1,1,1-TRICHLOROETHANE, CARBON TETRACHLORIDE AND CHLORINATED FLUOROCARBONS; ALL SPENT SOLVENT MIXTURES/BLENDS USED IN DEGREASING CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F002, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F005
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE(BY VOLUME) OF ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Violation Status: No violations found

HAZNET:

envid:	1005441125
Year:	2002
GEPAID:	CAR000115766
Contact:	REGINALD VEZIA/CHIEF ENGINEER
Telephone:	9163749133
Mailing Name:	Not reported
Mailing Address:	707 3rd St
Mailing City,St,Zip:	W Sacramento, CA 95605
Gen County:	Not reported
TSD EPA ID:	CAD059494310
TSD County:	Not reported
Waste Category:	Laboratory waste chemicals
Disposal Method:	Disposal, Other
Tons:	0.22
Facility County:	Yolo

envid:	1005441125
Year:	2002
GEPAID:	CAR000115766
Contact:	REGINALD VEZIA/CHIEF ENGINEER
Telephone:	9163749133
Mailing Name:	Not reported
Mailing Address:	707 3rd St
Mailing City,St,Zip:	W Sacramento, CA 95605
Gen County:	Not reported
TSD EPA ID:	CAD059494310
TSD County:	Not reported
Waste Category:	Laboratory waste chemicals
Disposal Method:	Treatment, Tank
Tons:	0.01
Facility County:	Yolo

FIRST UNION BANK C O JONES LANG LASALLE (Continued) **1005441125**

envid: 1005441125
Year: 2002
GEPAID: CAR000115766
Contact: REGINALD VEZIA/CHIEF ENGINEER
Telephone: 9163749133
Mailing Name: Not reported
Mailing Address: 707 3rd St
Mailing City,St,Zip: W Sacramento, CA 95605
Gen County: Not reported
TSD EPA ID: CAD059494310
TSD County: Not reported
Waste Category: Laboratory waste chemicals
Disposal Method: Transfer Station
Tons: 0.02
Facility County: Yolo

EMI:

Year:	2011
County Code:	57
Air Basin:	SV
Facility ID:	1076
Air District Name:	YS
SIC Code:	6282
Air District Name:	YOLO/SOLANO AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0.04
NOX - Oxides of Nitrogen Tons/Yr:	0.41
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0.02
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0.02

Year:	2012
County Code:	57
Air Basin:	SV
Facility ID:	1076
Air District Name:	YS
SIC Code:	6282
Air District Name:	YOLO/SOLANO AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0.04
NOX - Oxides of Nitrogen Tons/Yr:	0.41
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0.02
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0.02

AB202 **CITY OF SACTO-HALL OF JUSTICE** **CA Sacramento Co. ML** **S105267186**
SE **816 6TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.227 mi.
1199 ft. **Site 1 of 7 in cluster AB**

Relative:
Higher

Actual:
31 ft.

Sacramento Co. ML:

Facility Id:	U0015486
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Disclaimer
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	50
Food Bill Code:	50
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	06/01/1987
UST Inspection Date:	07/11/1988
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	9199
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AC203 **RIVERVIEW PLAZA** **CA UST** **U003786903**
SE **600 I ST** **CA Sacramento Co. ML** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.229 mi.
1207 ft. **Site 1 of 7 in cluster AC**

Relative:
Higher

Actual:
30 ft.

UST:

Facility ID:	FA0010655
Permitting Agency:	SACRAMENTO COUNTY
Latitude:	38.58279
Longitude:	-121.49818

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	A
Billing Codes UST:	A
WG Bill Code:	A
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	1
UST Tank Test Date:	Not reported

RIVERVIEW PLAZA (Continued) **U003786903**

SIC Code: Not reported
Tier Permitting: Not reported
AST Bill Code: Not reported
CALARP Bill Code: Not reported

AB204 **SMUD STATION A** **RCRA-SQG** **1004677038**
SE **6TH AND H STREET** **CAR000092528**
1/8-1/4 **SACRAMENTO, CA 95814**
0.229 mi.
1209 ft. **Site 2 of 7 in cluster AB**

Relative:
Higher

Actual:
31 ft.

RCRA-SQG:
Date form received by agency: 02/27/2002
Facility name: SMUD STATION A
Facility address: 6TH AND H STREET
SACRAMENTO, CA 95814
EPA ID: CAR000092528
Mailing address: P.O. BOX 15830 MS B203
SACRAMENTO, CA 958521
Contact: PATRICK G DURHAM
Contact address: Not reported
Not reported
Contact country: US
Contact telephone: (916) 732-6327
Telephone ext.: 6327
Contact email: PDURHAM@SMUD.ORG
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: SACRAMENTO MUNICIPAL UTIL DI
Owner/operator address: P O BOX 15830
SACRAMENTO, CA 95852
Owner/operator country: Not reported
Owner/operator telephone: (916) 452-3211
Legal status: District
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No

SMUD STATION A (Continued) **1004677038**

Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 02/27/2002
Site name: SMUD STATION A
Classification: Large Quantity Generator

. Waste code: 181
. Waste name: 181

. Waste code: D008
. Waste name: LEAD

Date form received by agency: 02/28/2001
Site name: SMUD STATION A
Classification: Large Quantity Generator

. Waste code: D000
. Waste name: Not Defined

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: D008
. Waste name: LEAD

. Waste code: D009
. Waste name: MERCURY

Violation Status: No violations found

AA205 **VACANT PROPERTY** **CA UST** **U004004440**
SW **710-712 3RD ST** **N/A**
1/8-1/4 **WEST SACRAMENTO, CA 95691**
0.230 mi.
1213 ft. **Site 2 of 3 in cluster AA**

Relative:
Higher

Actual:
26 ft.

YOLO CO. UST:
Facility Id: FA0002470
Owner Id: OW0002236
Owner Name: KNIGHT MGMT & DEVELOPMENT CORP
Owner Address: 944 47TH ST
Owner City/State/Zip: SACRAMENTO, CA 95819
Billing Name: VACANT PROPERTY
Billing Address1: 944 47TH ST
Billing City/State/Zip: SACRAMENTO, CA 95819
Contact Name: LEE, HARRY
Contact Phone: 916-381-6006, 916-966-7256
Current Status: Inactive, non-billable
Program Element: 2306 - UST PERMANENT CLOSURE PERMIT
Business Code: 01 - CORPORATION
Business Type: 1 - MOTOR VEHICLE FUEL

Tank Number: 1
Tank Status: Inactive

VACANT PROPERTY (Continued) **U004004440**

Tank Type:	Motor vehicle
Tank Description:	SINGLE-WALL
Tank Capacity:	1,000
Product Type:	Other
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	Not reported
INVGEN:	002470

AC206 **HING YEE** **EDR US Hist Cleaners** **1009143444**
SE **909 6TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.230 mi.
1214 ft. **Site 2 of 7 in cluster AC**

Relative:
Higher

Actual:
30 ft.

EDR Historical Cleaners:

Name:	DAGUE A C
Year:	1933
Type:	CLOTHES PRESSERS AND CLEANERS
Name:	WONG LOUIS
Year:	1937
Type:	LAUNDRIES-CHINESE
Name:	HING YEE
Year:	1942
Type:	LAUNDRIES-ORIENTAL

AB207 **SMUD STATION A SUBSTATION** **CA Sacramento Co. ML** **S116693928**
SE **6TH/H ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.230 mi.
1216 ft. **Site 3 of 7 in cluster AB**

Relative:
Higher

Actual:
31 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	A
Billing Codes UST:	Not reported
WG Bill Code:	Not reported
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

208
SE
1/8-1/4
0.231 mi.
1218 ft.

PACIFIC BELL
570 J ST
SACRAMENTO, CA 95814

RCRA NonGen / NLR
FINDS
CA Sacramento Co. ML

1000251705
CAT080027030

Relative:
Higher

Actual:
29 ft.

RCRA NonGen / NLR:

Date form received by agency:	01/22/1981
Facility name:	PACIFIC BELL
Facility address:	570 J ST SACRAMENTO, CA 95814
EPA ID:	CAT080027030
Mailing address:	3707 KINGS WAY SEC A-6 SACRAMENTO, CA 95821
Contact:	ENVIRONMENTAL MANAGER
Contact address:	570 J ST SACRAMENTO, CA 95814
Contact country:	US
Contact telephone:	(916) 485-0997
Contact email:	Not reported
EPA Region:	09
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	DOWNTOWN PLAZA ASSOCIATES
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	NOT REQUIRED
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No

PACIFIC BELL (Continued) **1000251705**

Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

FINDS:

Registry ID: 110002953705

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AC209 **DAGUE A C** **EDR US Hist Cleaners** **1009145794**
SE **921 6TH ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.232 mi.
1223 ft. **Site 3 of 7 in cluster AC**

Relative:
Higher

Actual:
30 ft.

EDR Historical Cleaners:

Name:	DAGUE A C
Year:	1928
Type:	CLEANERS AND DYERS
Name:	DAGUE A C
Year:	1928
Type:	CLEANERS AND DYERS
Name:	HUGGARD D A

DAGUE A C (Continued) **1009145794**

Year: 1952
Type: CLEANERS AND DYERS

AD210 **CHUNGKING LAUNDRY** **EDR US Hist Cleaners** **1009148015**
South **1124 2ND ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.234 mi.
1238 ft. **Site 1 of 4 in cluster AD**

Relative:
Higher

Actual:
25 ft.

EDR Historical Cleaners:
Name: CHUNGKING LAUNDRY
Year: 1956
Type: LAUNDRIES

Z211 **LINDEMAN BROS., INC.** **CA HIST UST** **U001612329**
WSW **800 E ST** **N/A**
1/8-1/4 **BRODERICK, CA 95605**
0.235 mi.
1241 ft. **Site 2 of 5 in cluster Z**

Relative:
Higher

Actual:
23 ft.

HIST UST:
Region: STATE
Facility ID: 00000013026
Facility Type: Other
Other Type: TRUCKING COMPANY
Contact Name: Not reported
Telephone: 9163719784
Owner Name: LINDEMAN BROS., INC.
Owner Address: 800 E STREET
Owner City,St,Zip: BRODERICK, CA 95605
Total Tanks: 0004

Tank Num: 001
Container Num: #1
Year Installed: Not reported
Tank Capacity: 00010429
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Container Construction Thickness: Not reported
Leak Detection: Stock Inventor

Tank Num: 002
Container Num: II
Year Installed: Not reported
Tank Capacity: 00009859
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Container Construction Thickness: Not reported
Leak Detection: Stock Inventor

Tank Num: 003
Container Num: III
Year Installed: Not reported
Tank Capacity: 00000500
Tank Used for: Not reported
Type of Fuel: Not reported

LINDEMAN BROS., INC. (Continued) **U001612329**

Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	004
Container Num:	IV
Year Installed:	Not reported
Tank Capacity:	00000500
Tank Used for:	WASTE
Type of Fuel:	WASTE OIL
Container Construction Thickness:	Not reported
Leak Detection:	Pressure Test

Z212 **LINDEMAN BROTHERS** **CA UST** **U004003779**
WSW **800 E ST** **N/A**
1/8-1/4 **W SACRAMENTO, CA 95691**
0.235 mi.
1241 ft. **Site 3 of 5 in cluster Z**

Relative:
Higher

Actual:
23 ft.

YOLO CO. UST:

Facility Id:	FA0000233
Owner Id:	OW0000193
Owner Name:	LINDEMAN BROTHERS INC
Owner Address:	P O BOX 727
Owner City/State/Zip:	W SACRAMENTO, CA 95691
Billing Name:	LINDEMAN BROS INC
Billing Address1:	P O BOX 727
Billing City/State/Zip:	WEST SACRAMENTO, CA 95691
Contact Name:	Not reported
Contact Phone:	Not reported
Current Status:	Inactive, non-billable
Program Element:	2306 - UST PERMANENT CLOSURE PERMIT
Business Code:	09 - UNKNOWN
Business Type:	6 - OTHER
Tank Number:	4
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	500
Product Type:	Used Oil
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	06/30/92
INVGEN:	1992000233
Tank Number:	1
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	10,000
Product Type:	Diesel
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	06/30/92
INVGEN:	1992000233
Tank Number:	2
Tank Status:	Inactive

LINDEMAN BROTHERS (Continued) **U004003779**

Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	9,859
Product Type:	Diesel
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	01/01/87
INVGEN:	1987000233

Tank Number:	3
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	500
Product Type:	Used Oil
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	01/01/87
INVGEN:	1987000233

AC213 **ANDERSON F G** **EDR US Hist Auto Stat** **1009020051**
SE **610 I ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.237 mi.
1253 ft. **Site 4 of 7 in cluster AC**

Relative:
Higher

Actual:
30 ft.

EDR Historical Auto Stations:

Name:	COURT GARAGE
Year:	1928
Type:	AUTOMOBILE GARAGES

Name:	COURT GARAGE
Year:	1928
Type:	AUTOMOBILE GARAGES

Name:	ANDERSON F G
Year:	1928
Type:	AUTOMOBILE REPAIRERS

Name:	ANDERSON F G
Year:	1928
Type:	AUTOMOBILE REPAIRERS

Name:	MILLIGAN ARTH
Year:	1933
Type:	AUTOMOBILE REPAIRING

Name:	MACCHIAVELLI E L
Year:	1952
Type:	AUTOMOBILE GARAGES

AD214 **KING G L** **EDR US Hist Cleaners** **1009144318**
South **1126 2ND ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.238 mi.
1255 ft. **Site 2 of 4 in cluster AD**

Relative:
Higher

Actual:
25 ft.

EDR Historical Cleaners:

Name:	LEE GEO
Year:	1933
Type:	LAUNDRIES CHINESE
Name:	LEE GEO
Year:	1937
Type:	LAUNDRIES-CHINESE
Name:	KING G L
Year:	1942
Type:	LAUNDRIES-ORIENTAL

AD215 **MATORIAN ABR** **EDR US Hist Cleaners** **1009146158**
South **1127 2ND ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.238 mi.
1258 ft. **Site 3 of 4 in cluster AD**

Relative:
Higher

Actual:
25 ft.

EDR Historical Cleaners:

Name:	MATORIAN ABR
Year:	1928
Type:	CLEANERS AND DYERS
Name:	MATORIAN ABR
Year:	1928
Type:	CLEANERS AND DYERS

AD216 **JENNINGS CHAS** **EDR US Hist Auto Stat** **1009018903**
South **1130 2ND ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.240 mi.
1265 ft. **Site 4 of 4 in cluster AD**

Relative:
Higher

Actual:
25 ft.

EDR Historical Auto Stations:

Name:	JENNINGS & ROUMAGE
Year:	1928
Type:	GASOLINE AND OIL SERVICE STATIONS
Name:	JENNINGS & ROUMAGE
Year:	1928
Type:	GASOLINE AND OIL SERVICE STATIONS
Name:	JENNINGS CHAS
Year:	1933
Type:	GASOLINE AND OIL SERVICE STATIONS
Name:	CALHOUN LOUIS C
Year:	1956
Type:	AUTOMOBILE REPAIRING

AA217 **LUNG CHONG LAUNDRY HAND** **EDR US Hist Cleaners** **1009145033**
SW **718 3RD ST** **N/A**
1/8-1/4 **BRODERICK, CA**
0.240 mi.
1265 ft. **Site 3 of 3 in cluster AA**

Relative:
Higher

Actual:
26 ft.

EDR Historical Cleaners:

Name:	LUNG CHONG LAUNDRY HAND
Year:	1961
Type:	LAUNDRIES

Z218 **SAN JOAQUIN MOTOR TRUCK** **CA UST** **U003895820**
WSW **805 E ST** **N/A**
1/8-1/4 **W SACRAMENTO, CA 95605**
0.240 mi.
1269 ft. **Site 4 of 5 in cluster Z**

Relative:
Higher

Actual:
24 ft.

YOLO CO. UST:

Facility Id:	FA0000339
Owner Id:	OW0000276
Owner Name:	SAN JOAQUIN MOTOR TRUCK
Owner Address:	243 HOSMEN ST
Owner City/State/Zip:	MODESTO, CA 95351
Billing Name:	Not reported
Billing Address1:	Not reported
Billing City/State/Zip:	Not reported
Contact Name:	Not reported
Contact Phone:	Not reported
Current Status:	Inactive, non-billable
Program Element:	2306 - UST PERMANENT CLOSURE PERMIT
Business Code:	09 - UNKNOWN
Business Type:	6 - OTHER
Tank Number:	1
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	10,000
Product Type:	Diesel
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	Not reported
INVGEN:	000339
Tank Number:	2
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	10,000
Product Type:	Diesel
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	Not reported
INVGEN:	000339

Z219 **PETERS TRUCK LINES#** **RCRA NonGen / NLR** **1000217901**
WSW **805 E ST** **FINDS** **CAD047887518**
1/8-1/4 **BRODERICK, CA 95605** **CA HIST UST**
0.240 mi.
1269 ft. **Site 5 of 5 in cluster Z**

Relative:
Higher

Actual:
24 ft.

RCRA NonGen / NLR:

Date form received by agency:	08/07/1980
Facility name:	PETERS TRUCK LINES#
Facility address:	805 E ST BRODERICK, CA 95605
EPA ID:	CAD047887518
Mailing address:	E ST BRODERICK, CA 95605
Contact:	ENVIRONMENTAL MANAGER
Contact address:	805 E ST BRODERICK, CA 95605
Contact country:	US
Contact telephone:	(916) 371-7720
Contact email:	Not reported
EPA Region:	09
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	WALTER F PETERS
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	NOT REQUIRED
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	Yes
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No

PETERS TRUCK LINES# (Continued) **1000217901**

Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

FINDS:

Registry ID: 110002647066

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

HIST UST:
Region: STATE
Facility ID: 00000038582
Facility Type: Other
Other Type: TRUCKING
Contact Name: Not reported
Telephone: 9163723731
Owner Name: PETERS TRUCK LINES
Owner Address: 805 "E" STREET
Owner City,St,Zip: BRODERICK, CA 95605
Total Tanks: 0002

Tank Num: 001
Container Num: #14
Year Installed: 1977
Tank Capacity: 00010000
Tank Used for: PRODUCT
Type of Fuel: REGULAR
Container Construction Thickness: Not reported
Leak Detection: Stock Inventor

Tank Num: 002
Container Num: #15
Year Installed: 1977
Tank Capacity: 00010000
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Container Construction Thickness: Not reported
Leak Detection: Stock Inventor

AE220
NNE
1/8-1/4
0.241 mi.
1271 ft.

SUPER 8 EXECUTIVE SUITES
216 BANNON ST
SACRAMENTO, CA 95814

Site 1 of 2 in cluster AE

CA Sacramento Co. ML **S105268029**
N/A

Relative:
Higher

Actual:
27 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	I
Billing Codes UST:	Not reported
WG Bill Code:	Not reported
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Disclaimer
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	50
Food Bill Code:	50
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AE221 **DOSSMAN BROS REPAIR** **EDR US Hist Auto Stat** **1009025115**
NNE **217 BANNON ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.243 mi.
1281 ft. **Site 2 of 2 in cluster AE**

Relative:
Higher

Actual:
27 ft.

EDR Historical Auto Stations:
Name: DOSSMAN BROS REPAIR
Year: 1966
Type: AUTOMOBILE REPAIRING

AC222 **BECHTEL CONSTRUCTION INC** **RCRA-SQG** **1000244219**
SE **621 I ST** **FINDS** **CAD981376726**
1/8-1/4 **SACRAMENTO, CA 95814**
0.244 mi.
1288 ft. **Site 5 of 7 in cluster AC**

Relative:
Higher

Actual:
30 ft.

RCRA-SQG:
Date form received by agency: 09/01/1996
Facility name: BECHTEL CONSTRUCTION INC
Facility address: 621 I ST
SACRAMENTO, CA 95814
EPA ID: CAD981376726
Mailing address: P O BOX 1108
SACRAMENTO, CA 95805
Contact: Not reported
Contact address: Not reported
Not reported
Contact country: US
Contact telephone: Not reported
Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: SACRAMENTO COUNTY JAIL
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

BECHTEL CONSTRUCTION INC (Continued) **1000244219**

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 01/31/1986
Site name: BECHTEL CONSTRUCTION INC
Classification: Large Quantity Generator

Violation Status: No violations found

FINDS:

Registry ID: 110002686086

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

AB223 **OLD SACRAMENTO JAIL** **CA FID UST** **S101590519**
SE **620 H ST** **CA SWEEPS UST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814** **CA Sacramento Co. ML**
0.246 mi.
1301 ft. **Site 4 of 7 in cluster AB**

Relative:
Higher

Actual:
28 ft.

CA FID UST:
Facility ID: 34001249
Regulated By: UTNKI
Regulated ID: 00014219
Cortese Code: Not reported
SIC Code: Not reported
Facility Phone: Not reported
Mail To: Not reported
Mailing Address: 609 NINTH ST
Mailing Address 2: Not reported
Mailing City,St,Zip: SACRAMENTO 95814
Contact: Not reported
Contact Phone: Not reported
DUNs Number: Not reported

OLD SACRAMENTO JAIL (Continued) **S101590519**

NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Inactive

SWEEPS UST:
Status: Not reported
Comp Number: 14219
Number: Not reported
Board Of Equalization: 44-019001
Referral Date: Not reported
Action Date: Not reported
Created Date: Not reported
Owner Tank Id: Not reported
SWRCB Tank Id: 34-000-014219-000001
Tank Status: Not reported
Capacity: 550
Active Date: Not reported
Tank Use: PETROLEUM
STG: PRODUCT
Content: LEADED GASOL
Number Of Tanks: 1

Sacramento Co. ML:
Facility Id: U0106586
Facility Status: Inactive. Included on a listing no longer updated.
FD: U
Billing Codes BP: Out of Business
Billing Codes UST: No Tanks
WG Bill Code: Oil Changed by Outside Company-No Fee
Target Property Bill Cod: 51
Food Bill Code: 51
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: Not reported
UST Permit Dt: 12/18/1986
UST Inspection Date: 02/11/1991
UST Tank Test Date: 08/02/1989
Number of Tanks: 0
UST Tank Test Date: Not reported
SIC Code: Not reported
Tier Permitting: Not reported
AST Bill Code: Not reported
CALARP Bill Code: Not reported

Facility Id: U0106586
Facility Status: Inactive. Included on a listing no longer updated.
FD: U
Billing Codes BP: Out of Business
Billing Codes UST: No Tanks
WG Bill Code: Oil Changed by Outside Company-No Fee
Target Property Bill Cod: 51
Food Bill Code: 51
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported

OLD SACRAMENTO JAIL (Continued) **S101590519**

HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	12/18/1986
UST Inspection Date:	02/11/1991
UST Tank Test Date:	08/02/1989
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AB224 **COUNTY MAIN JAIL** **CA HIST UST** **U001615076**
SE **620 "H" STREET** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.247 mi.
1306 ft. **Site 5 of 7 in cluster AB**

Relative:
Higher

Actual:
28 ft.

HIST UST:

Region:	STATE
Facility ID:	00000014219
Facility Type:	Other
Other Type:	COUNTY JAIL
Contact Name:	ELLIS MARVEL, BLDG SUPT
Telephone:	9163662121
Owner Name:	SACRAMENTO COUNTY/DEPARTMENT O
Owner Address:	4000 BRADSHAW ROAD
Owner City,St,Zip:	SACRAMENTO, CA 95827
Total Tanks:	0001
Tank Num:	001
Container Num:	ONE (1)
Year Installed:	Not reported
Tank Capacity:	00000550
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	None

AF225 **ARTENIAN GEO** **EDR US Hist Cleaners** **1009144308**
SSE **513 K ST** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.249 mi.
1316 ft. **Site 1 of 2 in cluster AF**

Relative:
Higher

Actual:
28 ft.

EDR Historical Cleaners:

Name:	ARTENIAN GEO
Year:	1933
Type:	HAT CLEANERS AND BLOCKERS
Name:	CHUEY YEE
Year:	1942
Type:	LAUNDRIES-ORIENTAL

AB226 **CITY OF SACRAMENTO** **CA Sacramento Co. ML** **S108217069**
SE **625 H ST** **N/A**
1/8-1/4 **SACRAMENTO, CA 95814**
0.250 mi.
1319 ft. **Site 6 of 7 in cluster AB**

Relative:
Higher

Actual:
28 ft.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	I
Billing Codes UST:	Not reported
WG Bill Code:	I
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	I
CALARP Bill Code:	Not reported

AF227 **SHRA LOT D** **CA Sacramento Co. CS** **S102437510**
SSE **510 DOWNTOWN PLAZA** **N/A**
1/8-1/4 **SACRAMENTO, CA**
0.250 mi.
1320 ft. **Site 2 of 2 in cluster AF**

Relative:
Higher

Actual:
28 ft.

Sacramento Co. CS:

State Site Number:	A593
Lead Staff:	Marcus, B.
Lead Agency:	HM
Remedial Action Taken:	YE, S
Substance:	Diesel
Date Reported:	05/22/1992
Facility Id:	RO0000337
Case Type:	Soil only
Case Closed:	Y
Date Closed:	**02/24/1993**

AB228 **FORMER CITY OF SACRAMENTO CRIME LAB REDEVELOPMENT SITE** **CA LUST** **S109417877**
SE **631 H STREET** **CA Sacramento Co. CS** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814** **CA Sacramento Co. ML**
0.254 mi.
1342 ft. **Site 7 of 7 in cluster AB**

Relative:
Higher

Actual:
28 ft.

LUST:

Region:	STATE
Global Id:	T10000000640
Latitude:	38.583922
Longitude:	-121.497314

FORMER CITY OF SACRAMENTO CRIME LAB REDEVELOPMENT SITE (Continued) **S109417877**

Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	02/18/2011
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	DVA
Local Agency:	SACRAMENTO COUNTY LOP
RB Case Number:	341494
LOC Case Number:	G112
File Location:	Local Agency
Potential Media Affect:	Other Groundwater (uses other than drinking water), Soil
Potential Contaminants of Concern:	Diesel, Other Petroleum
Site History:	A complete site history is available within several documents already uploaded to GeoTracker website. Please click on the "Site Maps / Documents" tab.

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T10000000640
Contact Type:	Local Agency Caseworker
Contact Name:	DAVID VON ASPERN
Organization Name:	SACRAMENTO COUNTY LOP
Address:	10590 ARMSTRONG AVENUE, SUITE A
City:	MATHER
Email:	vonaspernd@saccounty.net
Phone Number:	Not reported

Global Id:	T10000000640
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Status History:

Global Id:	T10000000640
Status:	Open - Site Assessment
Status Date:	12/07/2007

Global Id:	T10000000640
Status:	Completed - Case Closed
Status Date:	02/18/2011

Global Id:	T10000000640
Status:	Open - Case Begin Date
Status Date:	04/10/2007

Regulatory Activities:

Global Id:	T10000000640
Action Type:	ENFORCEMENT
Date:	08/26/2010
Action:	File review

Global Id:	T10000000640
Action Type:	ENFORCEMENT

FORMER CITY OF SACRAMENTO CRIME LAB REDEVELOPMENT SITE (Continued) **S109417877**

Date: 12/23/2010
Action: Staff Letter

Global Id: T10000000640
Action Type: Other
Date: 12/07/2007
Action: Leak Discovery

Global Id: T10000000640
Action Type: ENFORCEMENT
Date: 02/18/2011
Action: Closure/No Further Action Letter

Global Id: T10000000640
Action Type: Other
Date: 12/07/2007
Action: Leak Reported

Global Id: T10000000640
Action Type: RESPONSE
Date: 04/10/2007
Action: Preliminary Site Assessment Report

Global Id: T10000000640
Action Type: RESPONSE
Date: 01/02/2009
Action: Other Report / Document

Global Id: T10000000640
Action Type: RESPONSE
Date: 04/10/2007
Action: Preliminary Site Assessment Report

Global Id: T10000000640
Action Type: RESPONSE
Date: 12/23/2008
Action: Correspondence

Global Id: T10000000640
Action Type: ENFORCEMENT
Date: 12/23/2008
Action: Notice of Responsibility

Global Id: T10000000640
Action Type: RESPONSE
Date: 02/09/2011
Action: Well Destruction Report

Sacramento Co. CS:
State Site Number: G112
Lead Staff: Von Aspern, D.
Lead Agency: HM
Remedial Action Taken: NO
Substance: Not reported
Date Reported: Not reported
Facility Id: RO0001657

FORMER CITY OF SACRAMENTO CRIME LAB REDEVELOPMENT SITE (Continued) **S109417877**

Case Type: Other ground water affected
Case Closed: Y
Date Closed: 12/23/2008

Sacramento Co. ML:
Facility Id: U0013686
Facility Status: Inactive. Included on a listing no longer updated.
FD: U
Billing Codes BP: Disclaimer
Billing Codes UST: No Tanks
WG Bill Code: Oil Changed by Outside Company-No Fee
Target Property Bill Cod: 50
Food Bill Code: 50
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: Not reported
UST Permit Dt: Not reported
UST Inspection Date: Not reported
UST Tank Test Date: Not reported
Number of Tanks: Not reported
UST Tank Test Date: Not reported
SIC Code: Not reported
Tier Permitting: Not reported
AST Bill Code: Not reported
CALARP Bill Code: Not reported

AG229 **JIBBOOM JUNKYARD SUPERFUND SITE** **CONSENT 1000164253**
North **240 JIBBOOM ST** **PRP N/A**
1/4-1/2 **SACRAMENTO, CA 95814**
0.261 mi.
1379 ft. **Site 1 of 6 in cluster AG**

Relative:
Higher

Actual:
22 ft.

CONSENT:
EPA ID: CAD980737613
Site ID: Not reported
Case Title: U.S. AND THE STATE OF CALIFORNIA V. SOUTHERN PACIFIC TRANSPORTATION COMPANY, ET AL.
Court Num: 93-699
District: California, East
Entered Date: 19950317
Full-text of the consent decree for this site issued by the United States District Court is available from EDR. Contact your EDR Account Executive.

PRP:
PRP name: DEFENSE REUTILIZATION AND MARKETING SERVICE
DEFENSE REUTILIZATION AND MARKETING SERVICE
DEFENSE REUTILIZATION LOGISTICS AGENCY
LEVIN ENTERPRISES, INC.
LEVIN ENTERPRISES, INC.
PACIFIC GAS & ELECTRIC COMPANY
PACIFIC GAS & ELECTRIC COMPANY
SACRAMENTO MUNICIPAL UTILITY DISTRICT (SMUD)
SACRAMENTO MUNICIPAL UTILITY DISTRICT (SMUD)
SOUTHERN PACIFIC TRANSPORTATION CO.
SOUTHERN PACIFIC TRANSPORTATION CO.

AG230
North
1/4-1/2
0.261 mi.
1379 ft.

Relative:
Higher

Actual:
22 ft.

JIBBOOM JUNKYARD
240 - 260 JIBBOOM ST
SACRAMENTO, CA 95814

Site 2 of 6 in cluster AG

Database(s):
Delisted NPL
CERCLIS
RCRA-SQG
US ENG CONTROLS
ROD
ICIS
FINDS
LEAD SMELTERS

EDR ID Number: **1009966326**
EPA ID Number: **CAD980737613**

Delisted NPL:

EPA ID:	CAD980737613
Site ID:	0902040
EPA Region:	09
Federal:	No
Deleted Date:	1991-09-10 00:00:00

Category Details:

NPL Status:	Deleted from the Final NPL
Category Description:	Depth To Aquifer-> 25 And <= 50 Feet
Category Value:	35

NPL Status:	Deleted from the Final NPL
Category Description:	Distance To Nearest Population-> 1/4 And <= 1/2 Mile
Category Value:	1500

Site Details:

Site Name:	JIBBOOM JUNKYARD
Site Status:	Deleted
Site Zip:	95814
Site City:	SACRAMENTO
Site State:	CA
Federal Site:	No
Site County:	SACRAMENTO
EPA Region:	09
Date Proposed:	12/30/82
Date Deleted:	9/10/1991
Date Finalized:	09/08/83

Substance Details:

NPL Status:	Deleted from the Final NPL
Substance ID:	Not reported
Substance:	Not reported
CAS #:	Not reported
Pathway:	Not reported
Scoring:	Not reported

NPL Status:	Deleted from the Final NPL
Substance ID:	A046
Substance:	POLYCHLORINATED BIPHENYLS
CAS #:	1336-36-3
Pathway:	GROUND WATER PATHWAY
Scoring:	3

NPL Status:	Deleted from the Final NPL
Substance ID:	A046
Substance:	POLYCHLORINATED BIPHENYLS
CAS #:	1336-36-3
Pathway:	SURFACE WATER PATHWAY

JIBBOOM JUNKYARD (Continued) **1009966326**

Scoring: 3

NPL Status: Deleted from the Final NPL
Substance ID: C178
Substance: COPPER AND COMPOUNDS
CAS #: Not reported
Pathway: NO PATHWAY INDICATED
Scoring: 1

NPL Status: Deleted from the Final NPL
Substance ID: C247
Substance: ZINC AND COMPOUNDS
CAS #: Not reported
Pathway: NO PATHWAY INDICATED
Scoring: 1

NPL Status: Deleted from the Final NPL
Substance ID: D008
Substance: LEAD (PB)
CAS #: 7439-92-1
Pathway: NO PATHWAY INDICATED
Scoring: 1

NPL Status: Deleted from the Final NPL
Substance ID: W001
Substance: HEAVY METALS
CAS #: Not reported
Pathway: GROUND WATER PATHWAY
Scoring: 2

Summary Details:

Conditions at listing December 1982): The Jibboom Junkyard covers 9 acres in Sacramento, California, on the floodplain of the Sacramento River. A metal-salvaging business operated on the site. Among other things, the company dismantled transformers and possibly asbestos-lined boilers. The original si e of the site is unknown, but it may once have covered about 35 acres. Portions of the original site are now occupied by motels and/or are a part of Interstate Freeway I-5.Soil sampling by the State in 1981 detected levels of heavy metals exceeding the State s Total Threshold Limit Concentrations. There were also indications of PCB contamination. The soil is highly permeable, and the aquifer is 35 feet below thesurface. The city s drinking water is taken from the river at the northwest corner of the site. The river is also used for recreation and irrigation. Status July 1983): In April 1983, EPA collected soil samples, and in May 1983 the State fenced the site to limit public access. In June 1983, deep core samples were collected to further determine the extent and nature of contamination on the site.

Site Status Details:
NPL Status: Deleted
Proposed Date: 12/30/1982
Final Date: 09/08/1983
Deleted Date: 09/10/1991

Narratives Details:
NPL Name: JIBBOOM JUNKYARD
City: SACRAMENTO

JIBBOOM JUNKYARD (Continued) **1009966326**

State: CA

CERCLIS:

Site ID:	0902040
EPA ID:	CAD980737613
Facility County:	SACRAMENTO
Short Name:	JIBBOOM JUNKYARD
Congressional District:	6
IFMS ID:	0939
SMSA Number:	6920
USGC Hydro Unit:	18020109
Federal Facility:	Not a Federal Facility
DMNSN Number:	9.00000
Site Orphan Flag:	N
RCRA ID:	Not reported
USGS Quadrangle:	Not reported
Site Init By Prog:	Not reported
NFRAP Flag:	Not reported
Parent ID:	Not reported
RST Code:	Not reported
EPA Region:	09
Classification:	Landfill
Site Settings Code:	UR
NPL Status:	Deleted from the Final NPL
DMNSN Unit Code:	ACRE
RBRAC Code:	Not reported
RResp Fed Agency Code:	Not reported
Non NPL Status:	Not reported
Non NPL Status Date:	/ /
Site Fips Code:	06067
CC Concurrence Date:	03/31/88
CC Concurrence FY:	1988
Alias EPA ID:	Not reported
Site FUDS Flag:	Not reported

CERCLIS Site Contact Name(s):

Contact ID:	9000109.00000
Contact Name:	Richard Martyn
Contact Tel:	(415) 972-3038
Contact Title:	On-Scene Coordinator (OSC)
Contact Email:	Not reported
Contact ID:	9270063.00000
Contact Name:	Kevin Mayer
Contact Tel:	(415) 972-3176
Contact Title:	Remedial Project Manager (RPM)
Contact Email:	Not reported
Contact ID:	13000113.00000
Contact Name:	Lauren Berkman
Contact Tel:	(415) 972-2392
Contact Title:	Community Involvement Coordinator
Contact Email:	Not reported
Contact ID:	13003854.00000

JIBBOOM JUNKYARD (Continued) **1009966326**

Contact Name: Leslie Ramirez
Contact Tel: (415) 972-3978
Contact Title: Site Assessment Manager (SAM)
Contact Email: Not reported

Contact ID: 13003858.00000
Contact Name: Sharon Murray
Contact Tel: (415) 972-4250
Contact Title: Site Assessment Manager (SAM)
Contact Email: Not reported

Contact ID: 13004003.00000
Contact Name: Carl Brickner
Contact Tel: Not reported
Contact Title: Site Assessment Manager (SAM)
Contact Email: Not reported

CERCLIS Site Alias Name(s):
Alias ID: 101
Alias Name: CITY OF SACRAMENTO DUMP
Alias Address: Not reported
CA
Alias ID: 201
Alias Name: ASSOCIATED METALS
Alias Address: Not reported
CA
Alias ID: 301
Alias Name: PG&E POWER PLANT
Alias Address: Not reported
CA
Alias ID: 302
Alias Name: JIBBOOM JUNKYARD
Alias Address: 240 - 260 JIBBOOM ST
SACRAMENTO, CA 95814
Alias ID: 101
Alias ID: 301
Alias ID: 201
Alias Comments: PREVIOUS EPA ID# AZD 981 416 977PREVIOUS EPA ID# AZD 981 416 977PREVIOUS EPA ID# AZD 981 416 977

Site Description: The Jibboom Junkyard site is located in Sacramento, California on the east bank of the Sacramento River. The site is approximately 2000 feet downstream from the confluence of the American and Sacramento Rivers. The nine acre site is the former location of the Associated Metals Company salvage yard. The majority of the site, 6.7 acres, is now covered by Interstate 5 and the adjacent Jibboom Street. The remaining portion of the site, 2.3 acres, is a relatively flat open field, with one cluster of trees and no other surface structures or other objects present. The site lies within the 100 year floodplain of the Sacramento River. However, a California Department of Water Resources, Sacramento River Flood Control Project levee helps to protect the site from potential flooding. Situated in an industrial part of town, the site is approximately 4,000 feet from Old Sacramento, a historic downtown area, and approximately 6,000 feet from the State Capitol Building. At the northern edge of the site is an abandoned Pacific Gas and Electric Company (PG&E) steam electric power generating station that was constructed in 1912. Several motels are located to the north of the site along Jibboom Street. The closest of these motels is 400 feet from the site. A water intake structure is located 400 feet northwest of the site and 100 feet west of the levee bank of the Sacramento

JIBBOOM JUNKYARD (Continued) **1009966326**

River. This intake supplies water to the City of Sacramento Filtration Plant. This water filtration plant provides water for up to 50 percent of the city's population, approximately 145,000 people in downtown, western, and southern Sacramento. The filtration plant itself is 550 feet east of the uncovered portion of the site. Four hundred feet south and east of the site is a heavily industrialized area that has been in operation since the 1860's. Along the western edge of the site, on top of the levee, is a heavily used bike path constructed in 1983 as part of the Sacramento and American River Bikeway. There are no homes in the vicinity of the site. The only known residents in the area are members of a family who reside in a motel at the northern edge of the site. Groundwater beneath the site is used for industrial purposes only. There are no potable or agricultural uses of the groundwater in the area. The water is hydraulically connected to the Sacramento River. The river serves as a hydraulic connection, and presumably a barrier, to the potable groundwater that is on the western side of the Sacramento River. The groundwater beneath the site rises to within five feet of the ground surface for up to six months of the year. Flow direction is presumed to fluctuate biannually according to the river stage. Surface water over the covered portions of the site is collected in ditches on both sides of the freeway. This water is then pumped into the American River. Surface water from the remaining areas of the site either percolates into the ground or evaporates. The site is named for an unofficial landfill that was operated between the 1930's and the early 1970's along Jibboom Street to the north of the actual site. The nine acre site which was ranked for the National Priorities List (NPL) is defined by the boundaries of the operations at the now defunct Associated Metals Company yard. In 1863, Southern Pacific Transportation Company (SP) began operations at a 200 acre yard approximately 400 feet southeast of the site. This facility is a major locomotive overhaul facility for SP, and has historically handled large amounts of solvents, paints, sand blasting wastes (including wastes containing lead), petroleum, oils, and lubricants. In response to regulatory agency concern regarding the disposal of some of these materials, SP has begun an extensive soil and groundwater monitoring program. In 1912, PG&E constructed a steam electric power generating station north of the site. The station consisted of the main power generating building, three 12,000 barrel oil aboveground storage tanks on concrete pads with retaining walls, and two 200 barrel underground storage tanks. In 1957, PG&E ceased operations at this plant. By 1967, the three aboveground storage tanks had been dismantled and removed. The now historic PG&E building and the two underground storage tanks remain in place. Sometime prior to 1928, the City of Sacramento constructed a water filtration plant 150 feet due east of where the site would be located. This plant mixes treated water from the American and Sacramento Rivers to supply all 290,000 residents of Sacramento. A 1928 aerial photograph indicates that the Jibboom site was still wooded. By 1946, the original Jibboom Street alignment had been paved and the entire site had been cleared of trees. Disposal activities at the site were not evident. In 1950 or 1951, the property south of the power plant was purchased by the Associated Metals Company. The property was used for a metal salvage operation from this time until 1965. All grades of metal were salvaged, including railroad cars, army tanks, batteries, and some transformers. Although no inventories or records of operations at the yard are known to exist, a former employee indicated that there was on-site disposal of scrap metal as well as some direct discharge of transformer oils to the ground. Transformers were not frequently scrapped. This employee, who was the yard foreman, and historical aerial photographs have been the only sources of information regarding releases of hazardous materials at the Associated Metals yard. In 1965, the State of California Department of Transportation purchased all of the Associated Metals Company property for easement and

JIBBOOM JUNKYARD (Continued) **1009966326**

construction of I-5. No soils were removed, but the site was graded during freeway construction. By 1967, Jibboom Street was realigned to the present location. Between 1981 and 1985, EPA and the State of California Department of Health Services (DOHS) performed extensive on and offsite surface and subsurface soil sampling. In 1984, DOHS constructed a fence around the site. There have been no other response or enforcement activities to date. All of the contamination at this site appears to be the result of activities by the Associated Metals Company. The company is now defunct and all of its principals have deceased. California Secretary of State records indicate that neither Associated Metals Company nor Associated Iron and Metals, the only known alias of Associated Metals Company, were ever incorporated in the State of California. There are no known or suspected potential responsible parties at this site. While the State of California and the City of Sacramento currently own all of the land at the site, they were not owners or operators of the site at the time of disposal. Therefore, according to CERCLA Section 104(c)(3), the state is only liable for 10% of the remedial action costs. It is recommended that Trust Fund monies be used to fund the other 90% of the remedial action costs. A Record of Decision (ROD) addressing the overall site Operable Unit 01 (OU1) was completed in May 1985.

CERCLIS Assessment History:

Action Code:	001
Action:	DISCOVERY
Date Started:	/ /
Date Completed:	04/01/81
Priority Level:	Not reported
Operable Unit:	SITEWIDE
Primary Responsibility:	EPA Fund-Financed
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	PRELIMINARY ASSESSMENT
Date Started:	/ /
Date Completed:	08/01/82
Priority Level:	Higher priority for further assessment
Operable Unit:	SITEWIDE
Primary Responsibility:	EPA Fund-Financed
Planning Status:	Not reported
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	SITE INSPECTION
Date Started:	04/01/81
Date Completed:	12/01/82
Priority Level:	Higher priority for further assessment
Operable Unit:	SITEWIDE
Primary Responsibility:	State, Fund Financed
Planning Status:	Not reported
Urgency Indicator:	Not reported

JIBBOOM JUNKYARD (Continued) **1009966326**

Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 001
Action: HAZARD RANKING SYSTEM PACKAGE
Date Started: / /
Date Completed: 12/01/82
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 001
Action: PROPOSAL TO NATIONAL PRIORITIES LIST
Date Started: / /
Date Completed: 12/30/82
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 001
Action: FINAL LISTING ON NATIONAL PRIORITIES LIST
Date Started: / /
Date Completed: 09/08/83
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 001
Action: REMEDIAL INVESTIGATION
Date Started: 06/13/84
Date Completed: 05/09/85
Priority Level: Not reported
Operable Unit: OVERALL SITE
Primary Responsibility: EPA Fund-Financed
Planning Status: Primary
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

JIBBOOM JUNKYARD (Continued) **1009966326**

Action Code:	001
Action:	FEASIBILITY STUDY
Date Started:	06/13/84
Date Completed:	05/09/85
Priority Level:	Not reported
Operable Unit:	OVERALL SITE
Primary Responsibility:	EPA Fund-Financed
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	RECORD OF DECISION
Date Started:	/ /
Date Completed:	05/09/85
Priority Level:	Final Remedy Selected at Site
Operable Unit:	OVERALL SITE
Primary Responsibility:	EPA Fund-Financed
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	REMEDIAL DESIGN
Date Started:	05/23/85
Date Completed:	01/02/86
Priority Level:	Not reported
Operable Unit:	OVERALL SITE
Primary Responsibility:	EPA Fund-Financed
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	PRE-DESIGN ASSISTANCE
Date Started:	07/25/85
Date Completed:	09/01/86
Priority Level:	Not reported
Operable Unit:	OVERALL SITE
Primary Responsibility:	EPA Fund-Financed
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	COMMUNITY INVOLVEMENT
Date Started:	06/13/84
Date Completed:	07/01/87
Priority Level:	Not reported

JIBBOOM JUNKYARD (Continued) **1009966326**

Operable Unit: OVERALL SITE
Primary Responsibility: EPA Fund-Financed
Planning Status: Primary
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 001
Action: REMEDIAL ACTION
Date Started: 07/01/85
Date Completed: 07/01/87
Priority Level: Not reported
Operable Unit: OVERALL SITE
Primary Responsibility: EPA Fund-Financed
Planning Status: Primary
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 002
Action: CLOSE OUT REPORT
Date Started: / /
Date Completed: 03/31/88
Priority Level: Not reported
Operable Unit: OVERALL SITE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 002
Action: REMOVAL ASSESSMENT
Date Started: 09/05/90
Date Completed: 09/05/90
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Primary
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 001
Action: DELETION FROM NATIONAL PRIORITIES LIST
Date Started: 05/24/89
Date Completed: 09/10/91
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

JIBBOOM JUNKYARD (Continued) **1009966326**

For detailed financial records, contact EDR for a Site Report.:

Action Code: 001
Action: Special Notice Issued
Date Started: / /
Date Completed: 05/28/92
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 001
Action: REMOVAL ASSESSMENT
Date Started: / /
Date Completed: 12/10/92
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Primary
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 001
Action: Notice Letters Issued
Date Started: / /
Date Completed: 02/05/93
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code: 001
Action: Lodged By DOJ
Date Started: / /
Date Completed: 02/10/95
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: Federal Enforcement
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

For detailed financial records, contact EDR for a Site Report.:

JIBBOOM JUNKYARD (Continued) **1009966326**

Action Code:	001
Action:	CONSENT DECREE
Date Started:	06/25/92
Date Completed:	03/21/95
Priority Level:	Not reported
Operable Unit:	SITEWIDE
Primary Responsibility:	Federal Enforcement
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	SECTION 107 LITIGATION
Date Started:	06/25/92
Date Completed:	03/21/95
Priority Level:	Not reported
Operable Unit:	SITEWIDE
Primary Responsibility:	Federal Enforcement
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Action Code:	001
Action:	FIVE-YEAR REVIEW
Date Started:	01/20/07
Date Completed:	09/28/07
Priority Level:	Not reported
Operable Unit:	OVERALL SITE
Primary Responsibility:	EPA Fund-Financed
Planning Status:	Primary
Urgency Indicator:	Not reported
Action Anomaly:	Not reported

For detailed financial records, contact EDR for a Site Report.:

Federal Register Details:

Fed Register Date:	09/10/91
Fed Register Volume:	Not reported
Page Number:	Not reported

Fed Register Date:	09/08/83
Fed Register Volume:	48
Page Number:	40658

Fed Register Date:	12/30/82
Fed Register Volume:	47
Page Number:	58476

Click this hyperlink while viewing on your computer to access
38 additional US CERCLIS Financial: record(s) in the EDR Site Report.

JIBBOOM JUNKYARD (Continued) **1009966326**

RCRA-SQG:
Date form received by agency: 09/01/1996
Facility name: JIBBOOM JUNKYARD SUPERFUND SITE
Facility address: 240 JIBBOOM ST
SACRAMENTO, CA 95814
EPA ID: CAD980737613
Mailing address: 215 FREMONT ST T FOURTH 3
SAN FRANCISCO, CA 94105
Contact: Not reported
Contact address: Not reported
Not reported
Contact country: US
Contact telephone: Not reported
Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: STATE OF CALIFORNIA
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: State
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: State
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No

JIBBOOM JUNKYARD (Continued) **1009966326**

Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 08/22/1986
Site name: JIBBOOM JUNKYARD SUPERFUND SITE
Classification: Large Quantity Generator

Violation Status: No violations found

US ENG CONTROLS:
EPA ID: CAD980737613
Site ID: 0902040
Name: JIBBOOM JUNKYARD
Address: 240 - 260 JIBBOOM ST
SACRAMENTO, CA 95814
EPA Region: 09
County: SACRAMENTO
Event Code: Not reported
Actual Date: 06/30/1985

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 05/09/1985
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Disposal

Action ID: 001
Action Name: RECORD OF DECISION
Action Completion date: 05/09/1985
Operable Unit: 01
Contaminated Media : Soil
Engineering Control: Excavation

ROD:
Full-text of USEPA Record of Decision(s) is available from EDR.

ICIS:
Enforcement Action ID: 09-1992-0094
FRS ID: 110008264412
Program ID: CERCLIS CAD980737613
Action Name: LEVIN ENTERPRISES
Full Address: 240 JIBBOOM ST SACRAMENTO CA 95811
State: California
Facility Name: JIBBOOM JUNKYARD SUPERFUND SITE
Facility Address: 240 JIBBOOM ST
SACRAMENTO, CA 95811
Enforcement Action Type: Civil Judicial Action
Facility County: SACRAMENTO
EPA Region #: 9

Enforcement Action ID: 09-1992-0094
FRS ID: 110008264412

JIBBOOM JUNKYARD (Continued) **1009966326**

Program ID: DTSC-ENVIROSTOR 34490023
Action Name: LEVIN ENTERPRISES
Full Address: 240 JIBBOOM ST SACRAMENTO CA 95811
State: California
Facility Name: JIBBOOM JUNKYARD SUPERFUND SITE
Facility Address: 240 JIBBOOM ST
SACRAMENTO, CA 95811
Enforcement Action Type: Civil Judicial Action
Facility County: SACRAMENTO
EPA Region #: 9

Enforcement Action ID: 09-1992-0094
FRS ID: 110008264412
Program ID: RE-POWERING CAD980737613-18410
Action Name: LEVIN ENTERPRISES
Full Address: 240 JIBBOOM ST SACRAMENTO CA 95811
State: California
Facility Name: JIBBOOM JUNKYARD SUPERFUND SITE
Facility Address: 240 JIBBOOM ST
SACRAMENTO, CA 95811
Enforcement Action Type: Civil Judicial Action
Facility County: SACRAMENTO
EPA Region #: 9

Enforcement Action ID: 09-1992-0094
FRS ID: 110008264412
Program ID: RCRAINFO CAD980737613
Action Name: LEVIN ENTERPRISES
Full Address: 240 JIBBOOM ST SACRAMENTO CA 95811
State: California
Facility Name: JIBBOOM JUNKYARD SUPERFUND SITE
Facility Address: 240 JIBBOOM ST
SACRAMENTO, CA 95811
Enforcement Action Type: Civil Judicial Action
Facility County: SACRAMENTO
EPA Region #: 9

Enforcement Action ID: 09-1992-0094
FRS ID: 110008264412
Program ID: FRS 110008264412
Action Name: LEVIN ENTERPRISES
Full Address: 240 JIBBOOM ST SACRAMENTO CA 95811
State: California
Facility Name: JIBBOOM JUNKYARD SUPERFUND SITE
Facility Address: 240 JIBBOOM ST
SACRAMENTO, CA 95811
Enforcement Action Type: Civil Judicial Action
Facility County: SACRAMENTO
EPA Region #: 9

Program ID: CERCLIS CAD980737613
Facility Name: JIBBOOM JUNKYARD SUPERFUND SITE
Address: 240 JIBBOOM ST
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported

JIBBOOM JUNKYARD (Continued) **1009966326**

SIC Code: Not reported

Program ID: DTSC-ENVIROSTOR 34490023
Facility Name: JIBBOOM JUNKYARD SUPERFUND SITE
Address: 240 JIBBOOM ST
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: Not reported

Program ID: FRS 110008264412
Facility Name: JIBBOOM JUNKYARD SUPERFUND SITE
Address: 240 JIBBOOM ST
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: Not reported

Program ID: RCRAINFO CAD980737613
Facility Name: JIBBOOM JUNKYARD SUPERFUND SITE
Address: 240 JIBBOOM ST
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: Not reported

Program ID: RE-POWERING CAD980737613-18410
Facility Name: JIBBOOM JUNKYARD SUPERFUND SITE
Address: 240 JIBBOOM ST
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: Not reported

FINDS:

Registry ID: 110008264412

Environmental Interest/Information System

California Department of Toxic Substances Control EnviroStor System (DTSC-EnviroStor) is an online search and Geographic Information System (GIS) tool for identifying sites that have known contamination or sites for which there may be reasons to investigate further. The EnviroStor database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

CERCLIS (Comprehensive Environmental Response, Compensation, and Liability Information System) is the Superfund database that is used

JIBBOOM JUNKYARD (Continued) **1009966326**

to support management in all phases of the Superfund program. The system contains information on all aspects of hazardous waste sites, including an inventory of sites, planned and actual site activities, and financial information.

ICIS (Integrated Compliance Information System) is the Integrated Compliance Information System and provides a database that, when complete, will contain integrated Enforcement and Compliance information across most of EPA's programs. The vision for ICIS is to replace EPA's independent databases that contain Enforcement data with a single repository for that information. Currently, ICIS contains all Federal Administrative and Judicial enforcement actions. This information is maintained in ICIS by EPA in the Regional offices and it Headquarters. A future release of ICIS will replace the Permit Compliance System (PCS) which supports the NPDES and will integrate that information with Federal actions already in the system. ICIS also has the capability to track other activities occurring in the Region that support Compliance and Enforcement programs. These include; Incident Tracking, Compliance Assistance, and Compliance Monitoring.

Lead Smelter Sites:

Site ID:	0902040
Facility Region Id:	09
NPL Status:	Deleted from the Final NPL
Federal Facility:	No
Primary Site Type Category Description:	Recycling
Site Type Category Description 1:	Not reported
Site Type Category Description 2:	Not reported
Site Type Category Description 3:	Not reported
Latitude:	38.591659999999997
Longitude:	-121.5033

Site ID:	0902040
Facility Region Id:	09
NPL Status:	Deleted from the Final NPL
Federal Facility:	No
Primary Site Type Category Description:	Recycling
Site Type Category Description 1:	Not reported
Site Type Category Description 2:	Not reported
Site Type Category Description 3:	Not reported
Latitude:	38.591659999999997
Longitude:	-121.5033

Site ID:	0902040
Facility Region Id:	09
NPL Status:	Deleted from the Final NPL
Federal Facility:	No
Primary Site Type Category Description:	Recycling
Site Type Category Description 1:	Not reported
Site Type Category Description 2:	Not reported
Site Type Category Description 3:	Not reported
Latitude:	38.591659999999997
Longitude:	-121.5033

Site ID:	0902040
Facility Region Id:	09

JIBBOOM JUNKYARD (Continued) **1009966326**

NPL Status:	Deleted from the Final NPL
Federal Facility:	No
Primary Site Type Category Description:	Recycling
Site Type Category Description 1:	Not reported
Site Type Category Description 2:	Not reported
Site Type Category Description 3:	Not reported
Latitude:	38.591659999999997
Longitude:	-121.5033

Site ID:	0902040
Facility Region Id:	09
NPL Status:	Deleted from the Final NPL
Federal Facility:	No
Primary Site Type Category Description:	Recycling
Site Type Category Description 1:	Not reported
Site Type Category Description 2:	Not reported
Site Type Category Description 3:	Not reported
Latitude:	38.591659999999997
Longitude:	-121.5033

Site ID:	0902040
Facility Region Id:	09
NPL Status:	Deleted from the Final NPL
Federal Facility:	No
Primary Site Type Category Description:	Recycling
Site Type Category Description 1:	Not reported
Site Type Category Description 2:	Not reported
Site Type Category Description 3:	Not reported
Latitude:	38.591659999999997
Longitude:	-121.5033

AG231 **OLD PG&E PLANT** **CA HIST CORTESE** **S101300918**
North **240 JIBBOOM ST** **CA LUST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814** **CA SLIC**
0.261 mi. **CA Sacramento Co. CS**
1379 ft. **Site 3 of 6 in cluster AG** **CA DEED**
CA VCP
Relative: **CA Sacramento Co. ML**
Higher **CA ENVIROSTOR**

Actual: **22 ft.**

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	LTNKA
Reg Id:	340322

LUST:

Region:	STATE
Global Id:	T0606700255
Latitude:	38.594008
Longitude:	-121.505371
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	04/13/1999
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	Not reported
Local Agency:	Not reported

OLD PG&E PLANT (Continued) **S101300918**

RB Case Number: 340322
LOC Case Number: 0422/71422
File Location: Not reported
Potential Media Affect: Aquifer used for drinking water supply
Potential Contaminants of Concern: Heating Oil / Fuel Oil
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0606700255
Contact Type: Regional Board Caseworker
Contact Name: VERA FISCHER
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: vera.fischer@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0606700255
Status: Completed - Case Closed
Status Date: 04/13/1999

Global Id: T0606700255
Status: Open - Verification Monitoring
Status Date: 11/14/1990

Global Id: T0606700255
Status: Open - Case Begin Date
Status Date: 06/21/1988

Global Id: T0606700255
Status: Open - Remediation
Status Date: 06/21/1988

Global Id: T0606700255
Status: Open - Remediation
Status Date: 06/21/1989

Global Id: T0606700255
Status: Open - Site Assessment
Status Date: 08/30/1988

Global Id: T0606700255
Status: Open - Site Assessment
Status Date: 03/13/1989

Global Id: T0606700255
Status: Open - Site Assessment
Status Date: 06/21/1989

Regulatory Activities:
Global Id: T0606700255
Action Type: Other
Date: 08/30/1988
Action: Leak Discovery

OLD PG&E PLANT (Continued) **S101300918**

Global Id: T0606700255
Action Type: Other
Date: 09/12/1988
Action: Leak Reported

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 340322
Case Type: Drinking Water Aquifer affected
Substance: BUNKER FUEL OIL
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

SLIC:
Region: STATE
Facility Status: **Completed - Case Closed**
Status Date: 11/03/2011
Global Id: SLT5S1673207
Lead Agency: CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number: 34490056
Latitude: 38.59206975589
Longitude: -121.505205631256
Case Type: Cleanup Program Site
Case Worker: ZZZ
Local Agency: Not reported
RB Case Number: SLT5S167
File Location: Regional Board
Potential Media Affected: Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern: Polychlorinated biphenyls (PCBs)
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Region: STATE
Facility Status: **Open - Verification Monitoring**
Status Date: 08/19/1998
Global Id: SLT5S2133252
Lead Agency: CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number: 34490056
Latitude: 38.5933276045787
Longitude: -121.505613327026
Case Type: Cleanup Program Site
Case Worker: ZZZ
Local Agency: DEPARTMENT OF TOXIC SUBSTANCES CONTROL
RB Case Number: SLT5S213
File Location: DTSC
Potential Media Affected: Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern: Not reported
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

OLD PG&E PLANT (Continued) **S101300918**

SLIC REG 5:
Region: 5
Facility Status: RI
Unit: Facility is a Spill or site
Pollutant: PCBs, metals
Lead Agency: DTSC
Date Filed: 12/11/96
Report Date: 02/02/90
Date Added: Not reported
Date Closed: Not reported

Region: 5
Facility Status: Phase Two Remedial Investigation
Unit: Facility is a Spill or site
Pollutant: TPH
Lead Agency: DTSC
Date Filed: 04/13/99
Report Date: 04/13/99
Date Added: Not reported
Date Closed: Not reported

Sacramento Co. CS:
State Site Number: 0422/71422
Lead Staff: Hamilton, C.
Lead Agency: HM
Remedial Action Taken: YE, S
Substance: Bunker Fuel Oil
Date Reported: 08/30/1988
Facility Id: RO0000674
Case Type: Other ground water affected
Case Closed: Y
Date Closed: 04/13/1999

DEED:
Envirostor ID: 34490056
Area: PROJECT WIDE
Sub Area: Not reported
Site Type: VOLUNTARY CLEANUP
Status: CERTIFIED / OPERATION & MAINTENANCE
Agency: Not reported
Covenant Uploaded: Not reported
Deed Date(s): 07/30/1998

VCP:
Facility ID: 34490056
Site Type: Voluntary Cleanup
Site Type Detail: Voluntary Cleanup
Site Mgmt. Req.: REM, DAY, HOS, LUC, EX, NOWN, NDAM, SCH, RES
Acres: 5
National Priorities List: NO
Cleanup Oversight Agencies: SMBRP
Lead Agency: SMBRP
Lead Agency Description: DTSC - Site Cleanup Program
Project Manager: Peter Macnicholl
Supervisor: William Beckman

OLD PG&E PLANT (Continued) **S101300918**

Division Branch:	Cleanup Sacramento
Site Code:	101763
Assembly:	07
Senate:	06
Special Programs Code:	Voluntary Cleanup Program
Status:	Certified / Operation & Maintenance
Status Date:	08/19/1998
Restricted Use:	YES
Funding:	Responsible Party
Lat/Long:	38.59327 / -121.5055
APN:	NONE SPECIFIED
Past Use:	MANUFACTURED GAS PLANT, RECYCLING - SCRAP METAL
Potential COC:	30013, 30019
Confirmed COC:	30019,30013
Potential Description:	SOIL
Alias Name:	110033606729
Alias Type:	EPA (FRS #)
Alias Name:	SLT5S1673207
Alias Type:	GeoTracker Global ID
Alias Name:	SLT5S2133252
Alias Type:	GeoTracker Global ID
Alias Name:	100258
Alias Type:	Project Code (Site Code)
Alias Name:	101596
Alias Type:	Project Code (Site Code)
Alias Name:	101763
Alias Type:	Project Code (Site Code)
Alias Name:	34490056
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Investigation / Feasibility Study
Completed Date:	06/16/1995
Comments:	The RI/FS approved.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Report
Completed Date:	04/30/1992
Comments:	The PEA was completed on April 30 ,1992. Further action is required to remove contaminated soils and to further investigate ground water.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	5 Year Review Reports
Completed Date:	03/09/2010
Comments:	The remedial system is functioning as intended.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Technical Report
Completed Date:	03/23/2009
Comments:	The activities which included the installation of utilities atop the cap is acceptable. The VCA is considered closed pending payment of billing by the City.

OLD PG&E PLANT (Continued) **S101300918**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 02/08/2011
Comments: DTSC received the December 2010 GW Monitoring Report on February 8, 2011. The report was submitted as informational type document as was not expecting DTSC response comments on the document.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Soils Management Plan
Completed Date: 10/03/2012
Comments: DTSC approved various design plans on Oct. 3rd. Meeting with City of Sacramento to discuss additional administrative controls on Nov. 28th. Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 10/03/2012
Comments: DTSC approved the respective design plans on October 3, 2012. DTSC will be meeting with City of Sacramento and its consultants on Nov. 28th to discuss additional administrative controls.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 10/31/2012
Comments: DTSC concurred with the Design Plans presented by City of Sacramento in letter dated October 31, 2012.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 05/19/2014
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 10/03/2014
Comments: Construction Plans provided to the Department during the Annual LUC Inspection.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 09/09/2002
Comments: A Voluntary Cleanup Agreement was executed on September 9, 2002 for oversight of installation of two underground utilities. The water main extension and sewer extension will be constructed above the existing protective earthen clay cap and in a manner protective of current and future public health and safety.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement

OLD PG&E PLANT (Continued) **S101300918**

Completed Date: 08/12/1998
Comments: Agreement was signed for the continued operation and monitoring of the constructed soil cap remedy, groundwater monitoring system, and existing building and fence.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 07/30/1998
Comments: A deed restriction was recorded on a surveyed portion of the site prohibiting anyone in possession of the property from certain uses of the property including a residence, hospital, school, or day care center without a variance. Actions that would interfere with the integrity of the hazardous waste containment unit or monitoring system are prohibited without a variance.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Initial Study/ Neg. Declaration
Completed Date: 01/27/1997
Comments: A CEQA Final Negative Declaration and Notice of Determination for the remedial action at this site dated Dec. 16, 1996 was completed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 08/19/1998
Comments: The site is certified complete. The remedial actions required by the 12/17/97 RAP include a clay and earth cap over lead contaminated soil, a deed restriction limiting property from unrestricted uses, an operations and maintenance plan, and agreement to maintain the remedy.
Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 11/01/1994
Comments: DTSC signed an Interagency Agreement with DWR to complete the RI/FS, RAP and Certification of the site under the Voluntary Cleanup Program.
Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement
Completed Date: 08/10/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 08/29/1997
Comments: Response activities included the capping of approx. 1.5 acres, including the building. Capping involved backfill to grade. Cap includes two feet of compacted clay and one foot of soil topcover.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

OLD PG&E PLANT (Continued) **S101300918**

Completed Document Type: Design/Implementation Workplan
Completed Date: 12/17/1996
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 12/17/1996
Comments: Approx 0.75 acres have been capped and 2.5 acres released for reuse-commercial/industrial use only. Both the Remedial Action Plan (RAP) and Design (DES) have been approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Prospective Purchaser Agreement
Completed Date: 01/24/2002
Comments: Purcahse agreement signed and dated January 24, 2002.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 09/28/2009
Comments: Cost estimate sent to City of Sacramento.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement
Completed Date: 04/07/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 10/18/2005
Comments: An interagency agreement was completed for oversight of 5-year review of remedial action.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction - Site Inspection/Visit
Completed Date: 10/03/2014
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction - Site Inspection/Visit
Completed Date: 09/16/2009
Comments: A site visit with the City was completed to view conditions.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: 5 Year Review Reports
Schedule Due Date: 06/22/2015

OLD PG&E PLANT (Continued) **S101300918**

Schedule Revised Date:	Not reported
Schedule Area Name:	PROJECT WIDE
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Site Characterization Report
Schedule Due Date:	04/13/2015
Schedule Revised Date:	Not reported
Schedule Area Name:	PROJECT WIDE
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Site Characterization Report
Schedule Due Date:	04/13/2015
Schedule Revised Date:	Not reported

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

ENVIROSTOR:

Facility ID:	34490056
Status:	Certified / Operation & Maintenance
Status Date:	08/19/1998
Site Code:	101763
Site Type:	Voluntary Cleanup
Site Type Detailed:	Voluntary Cleanup
Acres:	5
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Peter Macnicholl
Supervisor:	William Beckman
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	Voluntary Cleanup Program
Restricted Use:	YES
Site Mgmt Req:	REM, DAY, HOS, LUC, EX, NOWN, NDAM, SCH, RES
Funding:	Responsible Party
Latitude:	38.59327

OLD PG&E PLANT (Continued) **S101300918**

Longitude: -121.5055
APN: NONE SPECIFIED
Past Use: MANUFACTURED GAS PLANT, RECYCLING - SCRAP METAL
Potential COC: Lead Polynuclear aromatic hydrocarbons (PAHs
Confirmed COC: Polynuclear aromatic hydrocarbons (PAHs Lead
Potential Description: SOIL
Alias Name: 110033606729
Alias Type: EPA (FRS #)
Alias Name: SLT5S1673207
Alias Type: GeoTracker Global ID
Alias Name: SLT5S2133252
Alias Type: GeoTracker Global ID
Alias Name: 100258
Alias Type: Project Code (Site Code)
Alias Name: 101596
Alias Type: Project Code (Site Code)
Alias Name: 101763
Alias Type: Project Code (Site Code)
Alias Name: 34490056
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 06/16/1995
Comments: The RI/FS approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 04/30/1992
Comments: The PEA was completed on April 30 ,1992. Further action is required to remove contaminated soils and to further investigate ground water.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: 5 Year Review Reports
Completed Date: 03/09/2010
Comments: The remedial system is functioning as intended.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 03/23/2009
Comments: The activities which included the installation of utilities atop the cap is acceptable. The VCA is considered closed pending payment of billing by the City.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 02/08/2011
Comments: DTSC received the December 2010 GW Monitoring Report on February 8, 2011. The report was submitted as informational type document as was not expecting DTSC response comments on the document.

Completed Area Name: PROJECT WIDE

OLD PG&E PLANT (Continued) **S101300918**

Completed Sub Area Name: Not reported
Completed Document Type: Soils Management Plan
Completed Date: 10/03/2012
Comments: DTSC approved various design plans on Oct. 3rd. Meeting with City of Sacramento to discuss additional administrative controls on Nov. 28th.
Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 10/03/2012
Comments: DTSC approved the respective design plans on October 3, 2012. DTSC will be meeting with City of Sacramento and its consultants on Nov. 28th to discuss additional administrative controls.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 10/31/2012
Comments: DTSC concurred with the Design Plans presented by City of Sacramento in letter dated October 31, 2012.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 05/19/2014
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 10/03/2014
Comments: Construction Plans provided to the Department during the Annual LUC Inspection.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 09/09/2002
Comments: A Voluntary Cleanup Agreement was executed on September 9, 2002 for oversight of installation of two underground utilities. The water main extension and sewer extension will be constructed above the existing protective earthen clay cap and in a manner protective of current and future public health and safety.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement
Completed Date: 08/12/1998
Comments: Agreement was signed for the continued operation and monitoring of the constructed soil cap remedy, groundwater monitoring system, and existing building and fence.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 07/30/1998

OLD PG&E PLANT (Continued) **S101300918**

Comments: A deed restriction was recorded on a surveyed portion of the site prohibiting anyone in possession of the property from certain uses of the property including a residence, hospital, school, or day care center without a variance. Actions that would interfere with the integrity of the hazardous waste containment unit or monitoring system are prohibited without a variance.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Initial Study/ Neg. Declaration
Completed Date: 01/27/1997
Comments: A CEQA Final Negative Declaration and Notice of Determination for the remedial action at this site dated Dec. 16, 1996 was completed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 08/19/1998
Comments: The site is certified complete. The remedial actions required by the 12/17/97 RAP include a clay and earth cap over lead contaminated soil, a deed restriction limiting property from unrestricted uses, an operations and maintenance plan, and agreement to maintain the remedy.
Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 11/01/1994
Comments: DTSC signed an Interagency Agreement with DWR to complete the RI/FS, RAP and Certification of the site under the Voluntary Cleanup Program.
Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement
Completed Date: 08/10/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 08/29/1997
Comments: Response activities included the capping of approx. 1.5 acres, including the building. Capping involved backfill to grade. Cap includes two feet of compacted clay and one foot of soil topcover.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 12/17/1996
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 12/17/1996
Comments: Approx 0.75 acres have been capped and 2.5 acres released for

OLD PG&E PLANT (Continued) **S101300918**

reuse-commercial/industrial use only. Both the Remedial Action Plan (RAP) and Design (DES) have been approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Prospective Purchaser Agreement
Completed Date: 01/24/2002
Comments: Purcahse agreement signed and dated January 24, 2002.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 09/28/2009
Comments: Cost estimate sent to City of Sacramento.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement
Completed Date: 04/07/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 10/18/2005
Comments: An interagency agreement was completed for oversight of 5-year review of remedial action.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction - Site Inspection/Visit
Completed Date: 10/03/2014
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction - Site Inspection/Visit
Completed Date: 09/16/2009
Comments: A site visit with the City was completed to view conditions.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: 5 Year Review Reports
Schedule Due Date: 06/22/2015
Schedule Revised Date: Not reported
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: Site Characterization Report
Schedule Due Date: 04/13/2015
Schedule Revised Date: Not reported
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: Site Characterization Report

OLD PG&E PLANT (Continued) **S101300918**

Schedule Due Date: 04/13/2015
Schedule Revised Date: Not reported

AG232 **JIBBOOM JUNKYARD** **CA HIST Cal-Sites** **S101481773**
North **240-260 JIBBOOM STREET** **CA ENVIROSTOR** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814**
0.263 mi.
1389 ft. **Site 4 of 6 in cluster AG**

Relative:
Higher

Actual:
22 ft.

Calsite:
Region: SACRAMENTO
Facility ID: 34490023
Facility Type: NPJF
Type: NPL SITE, JOINT STATE/FEDERAL-FUNDED
Branch: CC
Branch Name: CENTRAL CALIFORNIA
File Name: Not reported
State Senate District: 01021990
Status: CERTIFIED AS HAVING BEEN REMEDIED SATISFACTORILY UNDER DTSC OVERSIGHT
Status Name: CERTIFIED
Lead Agency: N/A
NPL: Delisted
SIC Code: 49
SIC Name: ELECTRIC, GAS & SANITARY SERVICES
Access: Not reported
Cortese: Not reported
Hazardous Ranking Score: Not reported
Date Site Hazard Ranked: Not reported
Groundwater Contamination: Not reported
Staff Member Responsible for Site: Not reported
Supervisor Responsible for Site: Not reported
Region Water Control Board: CV
Region Water Control Board Name: CENTRAL VALLEY
Lat/Long Direction: Not reported
Lat/Long (dms): 0 0 0 / 0 0 0
Lat/long Method: Not reported
Lat/Long Description: Not reported
State Assembly District Code: 09
State Senate District Code: 06
Facility ID: 34490023
Activity: SS
Activity Name: SITE SCREENING
AWP Code: Not reported
Proposed Budget: 0
AWP Completion Date: Not reported
Revised Due Date: Not reported
Comments Date: 01021987
Est Person-Yrs to complete: 0
Estimated Size: Not reported
Request to Delete Activity: Not reported
Activity Status: CERT
Definition of Status: CERTIFIED
Liquids Removed (Gals): 0
Liquids Treated (Gals): 0
Action Included Capping: Not reported
Well Decommissioned: Not reported
Action Included Fencing: Not reported
Removal Action Certification: Not reported

JIBBOOM JUNKYARD (Continued) **S101481773**

Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490023
Activity:	CERT
Activity Name:	CERTIFICATION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	01011990
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490023
Activity:	PRP
Activity Name:	POTENTIAL RESPONSIBLE PARTY SEARCH
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	12311992
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	CERT
Definition of Status:	CERTIFIED
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Alternate Address:	I-5 & JIBBOOM STREET
Alternate City,St,Zip:	SACRAMENTO, CA 95814
Alternate Address:	240-260 JIBBOOM STREET
Alternate City,St,Zip:	SACRAMENTO, CA 95814

JIBBOOM JUNKYARD (Continued) **S101481773**

Background Info: Not reported
Comments Date: 01021987
Comments: SITE SCREENING DONE
Comments Date: 01311983
Comments: This is the date the site was first listed pursuant to
Comments Date: 01311983
Comments: section 25356.
Comments Date: 04271981
Comments: INSPECTION(STATE) BY HMMS/ENF.
Comments Date: 06231981
Comments: INSPECTION(STATE) BY HMMS/ASP AND RWQCB
Comments Date: 06231981
Comments: GROUND PHOTOS GROUND PHOTOS
Comments Date: 08191991
Comments: Records Search: Site Certified as of January 1990
ID Name: EPA IDENTIFICATION NUMBER
ID Value: CAD980737613
ID Name: CALSTARS CODE
ID Value: 100080
Alternate Name: JIBBOOM JUNKYARDGREAT WESTERN POWERPG&EASSOCIATED METALSA-1 METALS
Special Programs Code: Not reported
Special Programs Name: Not reported

ENVIROSTOR:
Facility ID: 34490023
Status: Certified
Status Date: 01/02/1990
Site Code: 100080
Site Type: Federal Superfund
Site Type Detailed: State Response or NPL
Acres: 2.7
NPL: DELISTED
Regulatory Agencies: SMBRP, US EPA
Lead Agency: US EPA
Program Manager: Not reported
Supervisor: William Beckman
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Joint State/Federal-Funded
Latitude: 38.59701
Longitude: -121.5055
APN: NONE SPECIFIED
Past Use: METAL RECLAMATION
Potential COC: Lead Polychlorinated biphenyls (PCBs
Confirmed COC: Polychlorinated biphenyls (PCBs Lead
Potential Description: SOIL
Alias Name: A-1 METALS
Alias Type: Alternate Name
Alias Name: ASSOCIATED METALS
Alias Type: Alternate Name
Alias Name: GREAT WESTERN POWER
Alias Type: Alternate Name
Alias Name: PG&E

JIBBOOM JUNKYARD (Continued) **S101481773**

Alias Type:	Alternate Name
Alias Name:	CAD980737613
Alias Type:	EPA Identification Number
Alias Name:	110008264412
Alias Type:	EPA (FRS #)
Alias Name:	110033606738
Alias Type:	EPA (FRS #)
Alias Name:	100080
Alias Type:	Project Code (Site Code)
Alias Name:	34490023
Alias Type:	Envirostor ID Number
Alias Name:	http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/vwsoalphabetic/Jibboom+Junkyard?OpenDocument
Alias Type:	External Website Link / URL

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Certification
Completed Date:	01/01/1990
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Screening
Completed Date:	01/02/1987
Comments:	SITE SCREENING DONE
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	5 Year Review Reports
Completed Date:	09/28/2007
Comments:	Discretionary 5-year review report.
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

AC233 **SACRAMENTO COUNTY JAIL** **CA LUST** **S108723529**
SE **651 I STREET** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814**
0.265 mi.
1400 ft. **Site 6 of 7 in cluster AC**

Relative:
Higher

Actual:
29 ft.

LUST REG 5:

Region:	5
Status:	Leak being confirmed
Case Number:	341474
Case Type:	Undefined
Substance:	DIESEL
Staff Initials:	VJF
Lead Agency:	Local

SACRAMENTO COUNTY JAIL (Continued) **S108723529**

Program: LUST
MTBE Code: N/A

AC234 **SACRAMENTO COUNTY JAIL** **CA LUST** **S104569675**
SE **651 I STREET** **CA Sacramento Co. CS** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814** **CA Sacramento Co. ML**
0.265 mi.
1400 ft. **Site 7 of 7 in cluster AC**

Relative:
Higher

Actual:
29 ft.

LUST:

Region:	STATE
Global Id:	T0606714066
Latitude:	38.58314
Longitude:	-121.497407
Case Type:	LUST Cleanup Site
Status:	Open - Site Assessment
Status Date:	03/23/2007
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	DVA
Local Agency:	SACRAMENTO COUNTY LOP
RB Case Number:	341474
LOC Case Number:	G095
File Location:	Local Agency
Potential Media Affect:	Under Investigation
Potential Contaminants of Concern:	Diesel
Site History:	A complete site history is available within several documents already uploaded to GeoTracker website. Please click on the "Site Maps / Documents" tab.

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606714066
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0606714066
Contact Type:	Local Agency Caseworker
Contact Name:	DAVID VON ASPERN
Organization Name:	SACRAMENTO COUNTY LOP
Address:	10590 ARMSTRONG AVENUE, SUITE A
City:	MATHER
Email:	vonaspernd@saccounty.net
Phone Number:	Not reported

Status History:

Global Id:	T0606714066
Status:	Open - Site Assessment
Status Date:	03/23/2007

Global Id:	T0606714066
Status:	Open - Case Begin Date
Status Date:	03/20/2007

SACRAMENTO COUNTY JAIL (Continued) **S104569675**

Regulatory Activities:

Global Id:	T0606714066
Action Type:	Other
Date:	03/20/2007
Action:	Leak Discovery
Global Id:	T0606714066
Action Type:	ENFORCEMENT
Date:	09/16/2011
Action:	File review
Global Id:	T0606714066
Action Type:	ENFORCEMENT
Date:	08/26/2010
Action:	File review
Global Id:	T0606714066
Action Type:	RESPONSE
Date:	09/28/2012
Action:	Verbal Communication
Global Id:	T0606714066
Action Type:	ENFORCEMENT
Date:	11/03/2008
Action:	Staff Letter
Global Id:	T0606714066
Action Type:	Other
Date:	03/23/2007
Action:	Leak Reported
Global Id:	T0606714066
Action Type:	ENFORCEMENT
Date:	08/29/2008
Action:	File review
Global Id:	T0606714066
Action Type:	ENFORCEMENT
Date:	10/12/2007
Action:	Notice of Responsibility
Global Id:	T0606714066
Action Type:	ENFORCEMENT
Date:	09/02/2008
Action:	Notice to Comply
Global Id:	T0606714066
Action Type:	RESPONSE
Date:	10/30/2008
Action:	Preliminary Site Assessment Workplan
Global Id:	T0606714066
Action Type:	ENFORCEMENT
Date:	11/03/2008
Action:	File review
Global Id:	T0606714066

SACRAMENTO COUNTY JAIL (Continued) **S104569675**

Action Type: ENFORCEMENT
Date: 11/03/2008
Action: Staff Letter

Global Id: T0606714066
Action Type: ENFORCEMENT
Date: 08/29/2008
Action: Staff Letter

Global Id: T0606714066
Action Type: ENFORCEMENT
Date: 01/09/2009
Action: File review

Global Id: T0606714066
Action Type: ENFORCEMENT
Date: 10/12/2007
Action: Notice of Responsibility

Global Id: T0606714066
Action Type: RESPONSE
Date: 02/27/2009
Action: Preliminary Site Assessment Report

Global Id: T0606714066
Action Type: ENFORCEMENT
Date: 04/10/2009
Action: Site Visit / Inspection / Sampling

Sacramento Co. CS:
State Site Number: G095
Lead Staff: Von Aspern, D.
Lead Agency: HM
Remedial Action Taken: NO
Substance: Not reported
Date Reported: Not reported
Facility Id: RO0001634
Case Type: Not reported
Case Closed: Not reported
Date Closed: Not reported

Sacramento Co. ML:
Facility Id: Not reported
Facility Status: Not reported
FD: Not reported
Billing Codes BP: A
Billing Codes UST: A
WG Bill Code: A
Target Property Bill Cod: Not reported
Food Bill Code: Not reported
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: Not reported
UST Permit Dt: Not reported

SACRAMENTO COUNTY JAIL (Continued) **S104569675**

UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	1
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	A
Billing Codes UST:	Not reported
WG Bill Code:	Not reported
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

235
West
1/4-1/2
0.270 mi.
1426 ft.

MILNE TRUCKING **CA HIST CORTESE** **S102433400**
830 E ST **CA LUST** **N/A**
WEST SACRAMENTO, CA 95691

Relative:
Higher

Actual:
25 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	57
Reg By:	LTNKA
Reg Id:	570071

LUST:

Region:	STATE
Global Id:	T0611300046
Latitude:	38.58707357
Longitude:	-121.520543
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	05/05/2011
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	DFS
Local Agency:	YOLO COUNTY
RB Case Number:	570071
LOC Case Number:	Not reported
File Location:	Regional Board

MILNE TRUCKING (Continued) **S102433400**

Potential Media Affect: Aquifer used for drinking water supply
Potential Contaminants of Concern: Gasoline
Site History: The case was opened following an unauthorized release from an underground storage tank system at the subject site. Corrective action is underway as directed by the CVRWQCB. Corrective action may consist of preliminary site investigation, planning and implementation of remedial action, verification monitoring, or a combination thereof. A summary of the site history is available by clicking on either the "Cleanup Status History", "Regulatory Activities" or the "Site Maps/Documents" tab. For a complete site history the case file at the CVRWQCB should be consulted.

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0611300046
Contact Type: Local Agency Caseworker
Contact Name: ALEEM SHAFI
Organization Name: YOLO COUNTY
Address: 137 NORTH COTTONWOOD STREET, SUITE 2400
City: WOODLAND
Email: Not reported
Phone Number: Not reported

Global Id: T0611300046
Contact Type: Regional Board Caseworker
Contact Name: DAVID STAVAREK
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: dstavarek@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0611300046
Status: Open - Site Assessment
Status Date: 04/15/2005

Global Id: T0611300046
Status: Completed - Case Closed
Status Date: 05/05/2011

Global Id: T0611300046
Status: Open - Verification Monitoring
Status Date: 04/15/2005

Global Id: T0611300046
Status: Open - Case Begin Date
Status Date: 08/29/1988

Global Id: T0611300046
Status: Open - Remediation
Status Date: 04/20/1990

Regulatory Activities:
Global Id: T0611300046
Action Type: ENFORCEMENT

MILNE TRUCKING (Continued) **S102433400**

Date: 07/29/2005
Action: * Verbal Communication

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 07/03/2001
Action: * Historical Enforcement

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 10/31/1989
Action: File review

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 10/23/1989
Action: Site Visit / Inspection / Sampling

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 05/27/2010
Action: Staff Letter

Global Id: T0611300046
Action Type: RESPONSE
Date: 01/30/2002
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: RESPONSE
Date: 07/30/2002
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: RESPONSE
Date: 09/14/2001
Action: Soil and Water Investigation Report

Global Id: T0611300046
Action Type: RESPONSE
Date: 01/30/2003
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: RESPONSE
Date: 10/30/2002
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: RESPONSE
Date: 10/30/2001
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 02/24/2005
Action: Staff Letter

MILNE TRUCKING (Continued) **S102433400**

Global Id: T0611300046
Action Type: RESPONSE
Date: 11/15/1989
Action: CAP/RAP - Final Remediation / Design Plan

Global Id: T0611300046
Action Type: RESPONSE
Date: 01/30/2004
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: RESPONSE
Date: 07/27/2010
Action: Verbal Communication

Global Id: T0611300046
Action Type: RESPONSE
Date: 08/06/2010
Action: Conceptual Site Model

Global Id: T0611300046
Action Type: RESPONSE
Date: 07/31/2010
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: RESPONSE
Date: 10/06/2010
Action: Verbal Communication

Global Id: T0611300046
Action Type: REMEDIATION
Date: 03/15/1988
Action: Excavation

Global Id: T0611300046
Action Type: REMEDIATION
Date: 03/19/1987
Action: Monitored Natural Attenuation

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 05/03/2005
Action: * Historical Enforcement

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 09/14/2004
Action: Staff Letter

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 06/16/2006
Action: Staff Letter

Global Id: T0611300046
Action Type: ENFORCEMENT

MILNE TRUCKING (Continued) **S102433400**

Date: 05/05/2011
Action: Closure/No Further Action Letter

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 01/03/2011
Action: Staff Letter

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 01/11/2011
Action: Staff Letter

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 10/26/2010
Action: Staff Letter

Global Id: T0611300046
Action Type: Other
Date: 01/21/1995
Action: Leak Discovery

Global Id: T0611300046
Action Type: RESPONSE
Date: 07/30/2003
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: RESPONSE
Date: 04/30/2003
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: RESPONSE
Date: 10/31/2003
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: RESPONSE
Date: 04/15/2005
Action: Soil and Water Investigation Workplan

Global Id: T0611300046
Action Type: RESPONSE
Date: 02/25/2011
Action: Well Destruction Workplan

Global Id: T0611300046
Action Type: RESPONSE
Date: 03/11/2011
Action: Well Destruction Report

Global Id: T0611300046
Action Type: RESPONSE
Date: 04/21/2011
Action: Verbal Communication

MILNE TRUCKING (Continued) **S102433400**

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 06/28/2006
Action: Staff Letter

Global Id: T0611300046
Action Type: RESPONSE
Date: 12/05/2004
Action: Interim Remedial Action Plan

Global Id: T0611300046
Action Type: RESPONSE
Date: 07/30/2004
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 06/11/2008
Action: Verbal Communication

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 05/20/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300046
Action Type: RESPONSE
Date: 07/31/2005
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 10/23/2002
Action: File review

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 09/10/2003
Action: Staff Letter

Global Id: T0611300046
Action Type: RESPONSE
Date: 09/02/2005
Action: Other Report / Document

Global Id: T0611300046
Action Type: RESPONSE
Date: 09/02/2005
Action: Other Report / Document

Global Id: T0611300046
Action Type: RESPONSE
Date: 01/31/2006
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: RESPONSE

MILNE TRUCKING (Continued) **S102433400**

Date: 07/01/2006
Action: Interim Remedial Action Plan

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 07/01/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 06/10/2008
Action: Verbal Communication

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 06/18/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 11/17/2008
Action: Staff Letter

Global Id: T0611300046
Action Type: Other
Date: 08/29/1988
Action: Leak Reported

Global Id: T0611300046
Action Type: RESPONSE
Date: 12/02/2008
Action: Correspondence

Global Id: T0611300046
Action Type: RESPONSE
Date: 11/12/2008
Action: Verbal Communication

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 06/14/2006
Action: Staff Letter

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 11/15/2010
Action: Staff Letter

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 08/20/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 09/08/2008
Action: Technical Correspondence / Assistance / Other

MILNE TRUCKING (Continued) **S102433400**

Global Id: T0611300046
Action Type: RESPONSE
Date: 11/12/2008
Action: Verbal Communication

Global Id: T0611300046
Action Type: RESPONSE
Date: 08/13/2008
Action: Correspondence

Global Id: T0611300046
Action Type: RESPONSE
Date: 06/26/2006
Action: Soil and Water Investigation Workplan

Global Id: T0611300046
Action Type: RESPONSE
Date: 04/30/2002
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 05/03/2005
Action: Staff Letter

Global Id: T0611300046
Action Type: RESPONSE
Date: 01/16/2009
Action: Correspondence

Global Id: T0611300046
Action Type: RESPONSE
Date: 04/30/2004
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: RESPONSE
Date: 03/16/2010
Action: Correspondence

Global Id: T0611300046
Action Type: RESPONSE
Date: 03/12/2010
Action: Verbal Communication

Global Id: T0611300046
Action Type: RESPONSE
Date: 04/19/2010
Action: Verbal Communication

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 06/26/2000
Action: Staff Letter

Global Id: T0611300046
Action Type: ENFORCEMENT

MILNE TRUCKING (Continued) **S102433400**

Date: 07/03/2001
Action: Staff Letter

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 03/08/2000
Action: Staff Letter

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 05/03/2001
Action: Staff Letter

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 10/31/1989
Action: Staff Letter

Global Id: T0611300046
Action Type: ENFORCEMENT
Date: 07/15/2009
Action: Staff Letter

Global Id: T0611300046
Action Type: RESPONSE
Date: 02/26/2009
Action: Correspondence

Global Id: T0611300046
Action Type: RESPONSE
Date: 07/31/2008
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: RESPONSE
Date: 05/27/2010
Action: Verbal Communication

Global Id: T0611300046
Action Type: RESPONSE
Date: 01/31/2009
Action: Soil and Water Investigation Report

Global Id: T0611300046
Action Type: RESPONSE
Date: 10/31/2008
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: RESPONSE
Date: 04/30/2008
Action: Monitoring Report - Quarterly

Global Id: T0611300046
Action Type: RESPONSE
Date: 05/25/2010
Action: Correspondence

MILNE TRUCKING (Continued) **S102433400**

Global Id: T0611300046
Action Type: RESPONSE
Date: 01/31/2009
Action: Monitoring Report - Quarterly

LUST REG 5:
Region: 5
Status: Pollution Characterization
Case Number: 570071
Case Type: Drinking Water Aquifer affected
Substance: GASOLINE
Staff Initials: DFS
Lead Agency: Regional
Program: LUST
MTBE Code: 8

AH236 **RIVER ONE PROPERTY** **US BROWNFIELDS** **1016374067**
SSW **765 3RD STREET** **FINDS** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.285 mi.
1507 ft. **Site 1 of 2 in cluster AH**

Relative:
Higher

Actual:
23 ft.

US BROWNFIELDS:
Recipient name: West Sacramento, City of
Grant type: Assessment
Property name: RIVER ONE PROPERTY
Property #: 010-422-019, 010-422-020, 010-422-026, 010-422-027, 010-422-030, 010-422-032
Parcel size: 3.2
Property Description: The property has been mostly vacant, although a portion of it is believed to have been used for a gasoline service station in the 1970s.
Latitude: 38.5814162
Longitude: -121.5115258
HCM label: Address Matching-House Number
Map scale: Not reported
Point of reference: Entrance Point of a Facility or Station
Datum: North American Datum of 1983
ACRES property ID: 154821
Start date: Not reported
Completed date: Not reported
Acres cleaned up: Not reported
Cleanup funding: Not reported
Cleanup funding source: Not reported
Assessment funding: 3900
Assessment funding source: US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding: Not reported
Redev. funding source: Not reported
Redev. funding entity name: Not reported
Redevelopment start date: Not reported
Assessment funding entity: EPA
Cleanup funding entity: Not reported
Grant type: P
Accomplishment type: Phase I Environmental Assessment
Accomplishment count: 1
Cooperative agreement #: 00T27901
Ownership entity: Private

RIVER ONE PROPERTY (Continued) **1016374067**

Current owner:	Raley's
Did owner change:	N
Cleanup required:	No
Video available:	No
Photo available:	Yes
Institutional controls required:	N
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	No
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Not reported
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Not reported
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Not reported
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	1.6
Past use residential acreage:	Not reported
Past use commercial acreage:	1.6
Past use industrial acreage:	Not reported
Future use greenspace acreage:	.5
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported

RIVER ONE PROPERTY (Continued) **1016374067**

Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported
Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported
Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported

FINDS:

Registry ID: 110054364077

Environmental Interest/Information System
US EPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) is an federal online database for Brownfields Grantees to electronically submit data directly to EPA.

AG237 **TEXACO SS (FORMER)** **CA HIST CORTESE** **S100930739**
North **226 JIBBOOM ST** **CA LUST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814** **CA Sacramento Co. CS**
0.305 mi. **CA Sacramento Co. ML**
1610 ft. **Site 5 of 6 in cluster AG**

Relative:
Higher

Actual:
25 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	LTNKA
Reg Id:	340632

TEXACO SS (FORMER) (Continued) **S100930739**

LUST:

Region:	STATE
Global Id:	T0606700537
Latitude:	38.595838
Longitude:	-121.506041
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	07/10/1997
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	DWB
Local Agency:	SACRAMENTO COUNTY LOP
RB Case Number:	340632
LOC Case Number:	A291
File Location:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606700537
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0606700537
Contact Type:	Local Agency Caseworker
Contact Name:	DANA BOOTH
Organization Name:	SACRAMENTO COUNTY LOP
Address:	8475 JACKSON ROAD, SUITE 240
City:	SACRAMENTO
Email:	boothd@saccounty.net
Phone Number:	Not reported

Status History:

Global Id:	T0606700537
Status:	Completed - Case Closed
Status Date:	07/10/1997

Global Id:	T0606700537
Status:	Open - Case Begin Date
Status Date:	06/09/1988

Global Id:	T0606700537
Status:	Open - Site Assessment
Status Date:	07/20/1992

Global Id:	T0606700537
Status:	Open - Site Assessment
Status Date:	02/11/1997

TEXACO SS (FORMER) (Continued) **S100930739**

Regulatory Activities:

Global Id:	T0606700537
Action Type:	Other
Date:	06/09/1988
Action:	Leak Discovery

Global Id:	T0606700537
Action Type:	Other
Date:	07/20/1992
Action:	Leak Reported

LUST REG 5:

Region:	5
Status:	Case Closed
Case Number:	340632
Case Type:	Drinking Water Aquifer affected
Substance:	GASOLINE
Staff Initials:	VJF
Lead Agency:	Local
Program:	LUST
MTBE Code:	N/A

Sacramento Co. CS:

State Site Number:	A291
Lead Staff:	Booth, D.
Lead Agency:	HM
Remedial Action Taken:	NO
Substance:	8
Date Reported:	01/07/1994
Facility Id:	RO0000673
Case Type:	Other ground water affected
Case Closed:	Y
Date Closed:	**03/17/1997**

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported

TEXACO SS (FORMER) (Continued) **S100930739**

AST Bill Code: Not reported
CALARP Bill Code: Not reported

AG238 **SHELL #204-6678-9003** **CA HIST CORTESE** **S102437054**
North **225 JIBBOOM ST** **CA LUST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814** **CA Sacramento Co. CS**
0.310 mi.
1638 ft. **Site 6 of 6 in cluster AG**

Relative:
Higher

Actual:
25 ft.

HIST CORTESE:
Region: CORTESE
Facility County Code: 34
Reg By: LTNKA
Reg Id: 340586

LUST:
Region: STATE
Global Id: T0606700500
Latitude: 38.596097899
Longitude: -121.505453985
Case Type: LUST Cleanup Site
Status: Completed - Case Closed
Status Date: 08/19/2014
Lead Agency: SACRAMENTO COUNTY LOP
Case Worker: CWL
Local Agency: SACRAMENTO COUNTY LOP
RB Case Number: 340586
LOC Case Number: B557
File Location: Local Agency
Potential Media Affect: Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern: Gasoline
Site History: See GeoTrack link for Site History

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0606700500
Contact Type: Regional Board Caseworker
Contact Name: VERA FISCHER
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: vera.fischer@waterboards.ca.gov
Phone Number: Not reported

Global Id: T0606700500
Contact Type: Local Agency Caseworker
Contact Name: CHARLEY LANGER
Organization Name: SACRAMENTO COUNTY LOP
Address: 10590 ARMSTRONG AVENUE, SUITE A
City: MATHER
Email: langerc@saccounty.net
Phone Number: 9168758474

Status History:
Global Id: T0606700500
Status: Completed - Case Closed

SHELL #204-6678-9003 (Continued) **S102437054**

Status Date: 08/19/2014

Global Id: T0606700500
Status: Open - Case Begin Date
Status Date: 12/23/1986

Global Id: T0606700500
Status: Open - Eligible for Closure
Status Date: 07/29/2013

Global Id: T0606700500
Status: Open - Remediation
Status Date: 06/14/1988

Global Id: T0606700500
Status: Open - Site Assessment
Status Date: 07/28/1987

Regulatory Activities:

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 08/03/1987
Action: Notice of Responsibility

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 08/20/2014
Action: Closure/No Further Action Letter

Global Id: T0606700500
Action Type: RESPONSE
Date: 10/15/2013
Action: Request for Closure - Regulator Responded

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 03/18/2004
Action: Meeting

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 07/19/2005
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 09/14/2005
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 05/25/2005
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 10/01/2004

SHELL #204-6678-9003 (Continued) **S102437054**

Action: File review

Global Id: T0606700500
Action Type: Other
Date: 12/23/1986
Action: Leak Discovery

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 03/01/2005
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 03/02/2006
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 02/22/2006
Action: Meeting

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 06/20/2006
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 10/12/2010
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700500
Action Type: REMEDIATION
Date: 12/06/2005
Action: Excavation

Global Id: T0606700500
Action Type: REMEDIATION
Date: 01/23/2006
Action: Pump & Treat (P&T) Groundwater

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 03/14/2007
Action: Meeting

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 12/10/2007
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 09/06/2012
Action: Staff Letter

SHELL #204-6678-9003 (Continued) **S102437054**

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 03/20/2006
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 10/07/2004
Action: File review

Global Id: T0606700500
Action Type: Other
Date: 07/28/1987
Action: Leak Reported

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 01/27/2005
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 07/16/2008
Action: Meeting

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 09/11/2008
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 07/28/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 09/18/2008
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 11/07/2008
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 04/10/2007
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 12/29/2004
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT

SHELL #204-6678-9003 (Continued) **S102437054**

Date: 03/02/2004
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 11/01/2007
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 01/23/2006
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 09/19/2006
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 08/02/2007
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 12/18/2006
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 02/01/2008
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 10/05/2005
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 04/11/2006
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 02/18/2009
Action: File review

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 07/29/2013
Action: File review

Global Id: T0606700500
Action Type: RESPONSE
Date: 03/24/2009
Action: Correspondence

SHELL #204-6678-9003 (Continued) **S102437054**

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 04/21/2009
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700500
Action Type: ENFORCEMENT
Date: 11/04/2009
Action: Technical Correspondence / Assistance / Other

LUST REG 5:
Region: 5
Status: Preliminary site assessment underway
Case Number: 340586
Case Type: Other ground water affected
Substance: GASOLINE
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: 5

Sacramento Co. CS:
State Site Number: B557
Lead Staff: Bellan, J.
Lead Agency: HM
Remedial Action Taken: NO
Substance: Automotive(motor gasoline and additives)
Date Reported: 12/31/1986
Facility Id: RO0000672
Case Type: Other ground water affected
Case Closed: Not reported
Date Closed: Not reported

AI239 **ARCO SERVICE STATION NO. 6168** **CA Notify 65** **S100179023**
North **222 JIBBOOM STREET** **N/A**
1/4-1/2 **SACRAMENTO, CA 92324**
0.315 mi.
1664 ft. **Site 1 of 3 in cluster AI**

Relative:
Higher

Actual:
26 ft.

NOTIFY 65:
Date Reported: Not reported
Staff Initials: Not reported
Board File Number: Not reported
Facility Type: Not reported
Discharge Date: Not reported
Incident Description: 92324

AI240 **ARCO #6168** **CA LUST** **U003937776**
North **222 JIBBOOM ST** **CA UST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814**
0.315 mi.
1664 ft. **Site 2 of 3 in cluster AI**

Relative:
Higher

Actual:
26 ft.

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 340345
Case Type: Other ground water affected
Substance: GASOLINE
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: 2

UST:
Facility ID: FA0004440
Permitting Agency: SACRAMENTO COUNTY
Latitude: 38.597588
Longitude: -121.504715

AI241 **ARCO #6168** **CA HIST CORTESE** **S101300916**
North **222 JIBBOOM** **CA LUST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95813** **CA Sacramento Co. CS**
0.315 mi. **CA Sacramento Co. ML**
1664 ft. **Site 3 of 3 in cluster AI**

Relative:
Higher

Actual:
26 ft.

HIST CORTESE:
Region: CORTESE
Facility County Code: 34
Reg By: LTNKA
Reg Id: 340345

LUST:
Region: STATE
Global Id: T0606700277
Latitude: 38.5973748
Longitude: -121.5054207
Case Type: LUST Cleanup Site
Status: Completed - Case Closed
Status Date: 10/21/2005
Lead Agency: SACRAMENTO COUNTY LOP
Case Worker: CWL
Local Agency: SACRAMENTO COUNTY LOP
RB Case Number: 340345
LOC Case Number: 0479
File Location: Local Agency
Potential Media Affect: Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern: Gasoline
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0606700277
Contact Type: Local Agency Caseworker
Contact Name: CHARLEY LANGER

ARCO #6168 (Continued) **S101300916**

Organization Name: SACRAMENTO COUNTY LOP
Address: 10590 ARMSTRONG AVENUE, SUITE A
City: MATHER
Email: langerc@saccounty.net
Phone Number: 9168758474

Global Id: T0606700277
Contact Type: Regional Board Caseworker
Contact Name: VERA FISCHER
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: vera.fischer@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0606700277
Status: Completed - Case Closed
Status Date: 10/21/2005

Global Id: T0606700277
Status: Open - Case Begin Date
Status Date: 04/13/1989

Global Id: T0606700277
Status: Open - Remediation
Status Date: 06/18/1990

Global Id: T0606700277
Status: Open - Site Assessment
Status Date: 04/13/1989

Global Id: T0606700277
Status: Open - Site Assessment
Status Date: 04/18/1989

Global Id: T0606700277
Status: Open - Site Assessment
Status Date: 03/22/1990

Global Id: T0606700277
Status: Open - Site Assessment
Status Date: 05/09/1990

Regulatory Activities:
Global Id: T0606700277
Action Type: ENFORCEMENT
Date: 01/11/2005
Action: File review

Global Id: T0606700277
Action Type: Other
Date: 04/13/1989
Action: Leak Discovery

Global Id: T0606700277

ARCO #6168 (Continued) **S101300916**

Action Type: ENFORCEMENT
Date: 07/15/2005
Action: * Historical Enforcement

Global Id: T0606700277
Action Type: Other
Date: 04/13/1989
Action: Leak Stopped

Global Id: T0606700277
Action Type: ENFORCEMENT
Date: 02/03/2004
Action: File review

Global Id: T0606700277
Action Type: Other
Date: 04/18/1989
Action: Leak Reported

Global Id: T0606700277
Action Type: ENFORCEMENT
Date: 10/28/2004
Action: File review

Global Id: T0606700277
Action Type: ENFORCEMENT
Date: 05/18/2005
Action: Staff Letter

Global Id: T0606700277
Action Type: ENFORCEMENT
Date: 10/12/2005
Action: * Verbal Communication

Global Id: T0606700277
Action Type: ENFORCEMENT
Date: 01/02/1991
Action: Notice of Responsibility

Sacramento Co. CS:
State Site Number: 0479
Lead Staff: Langer, C.
Lead Agency: HM
Remedial Action Taken: NO
Substance: Automotive(motor gasoline and additives)
Date Reported: 04/18/1989
Facility Id: RO0000671
Case Type: Other ground water affected
Case Closed: Not reported
Date Closed: Not reported

Sacramento Co. ML:
Facility Id: Not reported
Facility Status: Not reported
FD: Not reported

ARCO #6168 (Continued) **S101300916**

Billing Codes BP:	A
Billing Codes UST:	A
WG Bill Code:	A
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	3
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AJ242 **DOWNTOWN PARKING GARAGE** **CA LUST** **S105488632**
ESE **725 7TH ST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814**
0.322 mi.
1698 ft. **Site 1 of 3 in cluster AJ**

Relative:
Higher

Actual:
26 ft.

LUST REG 5:

Region:	5
Status:	No Action
Case Number:	341388
Case Type:	Other ground water affected
Substance:	GASOLINE
Staff Initials:	VJF
Lead Agency:	Local
Program:	LUST
MTBE Code:	N/A

AJ243 **DOWNTOWN PARKING GARAGE** **CA LUST** **U001615088**
ESE **725 7TH ST** **CA Sacramento Co. CS** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814** **CA HIST UST**
0.322 mi. **CA Sacramento Co. ML**
1698 ft. **Site 2 of 3 in cluster AJ**

Relative:
Higher

Actual:
26 ft.

LUST:

Region:	STATE
Global Id:	T0606792021
Latitude:	38.58422
Longitude:	-121.496055
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	06/03/2011
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	DVA
Local Agency:	SACRAMENTO COUNTY LOP
RB Case Number:	341388
LOC Case Number:	F523
File Location:	Local Agency

DOWNTOWN PARKING GARAGE (Continued) **U001615088**

Potential Media Affect: Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern: Gasoline
Site History: A complete site history is available within several documents already uploaded to GeoTracker website. Please click on the "Site Maps / Documents" tab.

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0606792021
Contact Type: Local Agency Caseworker
Contact Name: DAVID VON ASPERN
Organization Name: SACRAMENTO COUNTY LOP
Address: 10590 ARMSTRONG AVENUE, SUITE A
City: MATHER
Email: vonaspernd@saccounty.net
Phone Number: Not reported

Global Id: T0606792021
Contact Type: Regional Board Caseworker
Contact Name: VERA FISCHER
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: vera.fischer@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0606792021
Status: Completed - Case Closed
Status Date: 10/31/1999

Global Id: T0606792021
Status: Completed - Case Closed
Status Date: 06/03/2011

Global Id: T0606792021
Status: Open - Case Begin Date
Status Date: 10/31/1999

Global Id: T0606792021
Status: Open - Reopen Case
Status Date: 10/31/1999

Global Id: T0606792021
Status: Open - Site Assessment
Status Date: 02/27/2004

Regulatory Activities:
Global Id: T0606792021
Action Type: ENFORCEMENT
Date: 03/16/2004
Action: Staff Letter

Global Id: T0606792021
Action Type: ENFORCEMENT
Date: 06/02/2011

DOWNTOWN PARKING GARAGE (Continued) **U001615088**

Action: File Review - Closure

Global Id: T0606792021
Action Type: ENFORCEMENT
Date: 02/17/2011
Action: File Review - Closure

Global Id: T0606792021
Action Type: Other
Date: 11/01/1999
Action: Leak Discovery

Global Id: T0606792021
Action Type: ENFORCEMENT
Date: 08/26/2010
Action: File review

Global Id: T0606792021
Action Type: ENFORCEMENT
Date: 06/03/2011
Action: Closure/No Further Action Letter

Global Id: T0606792021
Action Type: Other
Date: 03/25/2002
Action: Leak Reported

Global Id: T0606792021
Action Type: ENFORCEMENT
Date: 03/15/2005
Action: Staff Letter

Global Id: T0606792021
Action Type: ENFORCEMENT
Date: 11/01/2005
Action: * Historical Enforcement

Global Id: T0606792021
Action Type: ENFORCEMENT
Date: 03/23/2009
Action: Staff Letter

Global Id: T0606792021
Action Type: RESPONSE
Date: 11/21/2008
Action: Soil and Water Investigation Workplan

Global Id: T0606792021
Action Type: ENFORCEMENT
Date: 04/01/2009
Action: Technical Correspondence / Assistance / Other

Global Id: T0606792021
Action Type: RESPONSE
Date: 11/12/2008
Action: Soil and Water Investigation Workplan

DOWNTOWN PARKING GARAGE (Continued) **U001615088**

Global Id: T0606792021
Action Type: RESPONSE
Date: 11/07/2008
Action: Soil and Water Investigation Workplan

Global Id: T0606792021
Action Type: RESPONSE
Date: 04/08/2009
Action: Correspondence

Global Id: T0606792021
Action Type: RESPONSE
Date: 03/23/2009
Action: Correspondence

Global Id: T0606792021
Action Type: RESPONSE
Date: 01/28/2009
Action: Soil and Water Investigation Report

Global Id: T0606792021
Action Type: RESPONSE
Date: 09/03/2008
Action: Other Report / Document

Global Id: T0606792021
Action Type: RESPONSE
Date: 09/17/2008
Action: Soil and Water Investigation Workplan

Sacramento Co. CS:
State Site Number: C348
Lead Staff: Von Aspern, D.
Lead Agency: HM
Remedial Action Taken: NO
Substance: Automotive(motor gasoline and additives)
Date Reported: 10/19/1999
Facility Id: RO0001371
Case Type: Other ground water affected
Case Closed: Not reported
Date Closed: Not reported

HIST UST:
Region: STATE
Facility ID: 00000020419
Facility Type: Gas Station
Other Type: PARKING & MAINTENANC
Contact Name: MICHAEL SILVEY
Telephone: 9164406462
Owner Name: COUNTY OF SACRAMENTO, AUTOMOTI
Owner Address: 725 7TH STREET
Owner City,St,Zip: SACRAMENTO, CA 95814
Total Tanks: 0006

Tank Num: 001

DOWNTOWN PARKING GARAGE (Continued) **U001615088**

Container Num:	1
Year Installed:	1973
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	002
Container Num:	2
Year Installed:	1973
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	003
Container Num:	4
Year Installed:	1973
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	004
Container Num:	3
Year Installed:	1973
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	005
Container Num:	5
Year Installed:	1973
Tank Capacity:	00001500
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	006
Container Num:	6
Year Installed:	1973
Tank Capacity:	00001500
Tank Used for:	WASTE
Type of Fuel:	WASTE OIL
Container Construction Thickness:	Not reported
Leak Detection:	None

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported

DOWNTOWN PARKING GARAGE (Continued) **U001615088**

Billing Codes BP:	A
Billing Codes UST:	A
WG Bill Code:	A
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	3
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AH244 **TEXACO SERVICE STATION (FORMER)** **CA LUST** **S110655969**
SW **WEST CAPITOL & THIRD STREET** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.325 mi.
1718 ft. **Site 2 of 2 in cluster AH**

Relative:
Higher

Actual:
24 ft.

LUST:

Region:	STATE
Global Id:	T0611344694
Latitude:	38.582187086
Longitude:	-121.511822278
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	08/17/2007
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	DFS
Local Agency:	YOLO COUNTY
RB Case Number:	570330
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	Waste Oil / Motor / Hydraulic / Lubricating, Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0611344694
Contact Type:	Local Agency Caseworker
Contact Name:	JEFF PINNOW
Organization Name:	YOLO COUNTY
Address:	137 N. COTTONWOOD STREET, SUITE 2400
City:	WOODLAND
Email:	jpinnow@yolocounty.org
Phone Number:	Not reported

Global Id:	T0611344694
Contact Type:	Regional Board Caseworker
Contact Name:	DAVID STAVAREK

TEXACO SERVICE STATION (FORMER) (Continued) **S110655969**

Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: dstavarek@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0611344694
Status: Open - Site Assessment
Status Date: 02/03/2005

Global Id: T0611344694
Status: Open - Site Assessment
Status Date: 02/22/2006

Global Id: T0611344694
Status: Completed - Case Closed
Status Date: 08/17/2007

Global Id: T0611344694
Status: Open - Case Begin Date
Status Date: 02/03/2005

Regulatory Activities:
Global Id: T0611344694
Action Type: ENFORCEMENT
Date: 03/23/2005
Action: * No Action

Global Id: T0611344694
Action Type: REMEDIATION
Date: 02/03/2005
Action: Not reported

Global Id: T0611344694
Action Type: ENFORCEMENT
Date: 03/14/2006
Action: Staff Letter

Global Id: T0611344694
Action Type: ENFORCEMENT
Date: 07/15/2005
Action: File review

Global Id: T0611344694
Action Type: ENFORCEMENT
Date: 11/18/2005
Action: File review

Global Id: T0611344694
Action Type: ENFORCEMENT
Date: 11/10/2005
Action: File review

Global Id: T0611344694
Action Type: Other

TEXACO SERVICE STATION (FORMER) (Continued) **S110655969**

Date:	02/03/2005
Action:	Leak Discovery
Global Id:	T0611344694
Action Type:	ENFORCEMENT
Date:	05/08/2007
Action:	Notification - Public Participation Document
Global Id:	T0611344694
Action Type:	ENFORCEMENT
Date:	08/14/2007
Action:	Technical Correspondence / Assistance / Other
Global Id:	T0611344694
Action Type:	RESPONSE
Date:	01/31/2006
Action:	Monitoring Report - Quarterly
Global Id:	T0611344694
Action Type:	ENFORCEMENT
Date:	08/09/2007
Action:	Technical Correspondence / Assistance / Other
Global Id:	T0611344694
Action Type:	ENFORCEMENT
Date:	08/17/2007
Action:	Closure/No Further Action Letter
Global Id:	T0611344694
Action Type:	RESPONSE
Date:	02/28/2006
Action:	Soil and Water Investigation Workplan
Global Id:	T0611344694
Action Type:	RESPONSE
Date:	04/30/2006
Action:	Monitoring Report - Quarterly
Global Id:	T0611344694
Action Type:	RESPONSE
Date:	07/30/2006
Action:	Monitoring Report - Quarterly
Global Id:	T0611344694
Action Type:	ENFORCEMENT
Date:	05/03/2007
Action:	Staff Letter
Global Id:	T0611344694
Action Type:	ENFORCEMENT
Date:	07/11/2007
Action:	Verbal Communication
Global Id:	T0611344694
Action Type:	ENFORCEMENT
Date:	08/13/2007
Action:	Technical Correspondence / Assistance / Other

TEXACO SERVICE STATION (FORMER) (Continued) **S110655969**

Global Id:	T0611344694
Action Type:	ENFORCEMENT
Date:	07/24/2007
Action:	Verbal Communication
Global Id:	T0611344694
Action Type:	ENFORCEMENT
Date:	07/27/2007
Action:	Verbal Communication
Global Id:	T0611344694
Action Type:	ENFORCEMENT
Date:	07/30/2007
Action:	Technical Correspondence / Assistance / Other
Global Id:	T0611344694
Action Type:	Other
Date:	06/22/2005
Action:	Leak Reported
Global Id:	T0611344694
Action Type:	ENFORCEMENT
Date:	01/03/2006
Action:	Staff Letter
Global Id:	T0611344694
Action Type:	ENFORCEMENT
Date:	05/02/2007
Action:	Meeting
Global Id:	T0611344694
Action Type:	RESPONSE
Date:	06/29/2007
Action:	Other Report / Document

AK245 **SCHETTER ELECTRIC** **CA LUST** **S106859275**
NE **471 BANNON STREET** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814**
0.330 mi.
1745 ft. **Site 1 of 3 in cluster AK**

Relative:
Higher

Actual:
26 ft.

LUST REG 5:

Region:	5
Status:	Leak being confirmed
Case Number:	341444
Case Type:	Undefined
Substance:	GASOLINE
Staff Initials:	VJF
Lead Agency:	Local
Program:	LUST
MTBE Code:	N/A

AK246 **SCHETTER ELECTRIC** **CA LUST** **S103706822**
NE **471 BANNON STREET** **CA Sacramento Co. CS** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814** **CA Sacramento Co. ML**
0.330 mi.
1745 ft. **Site 2 of 3 in cluster AK**

Relative:
Higher

Actual:
26 ft.

LUST:

Region:	STATE
Global Id:	T0606797784
Latitude:	38.594209
Longitude:	-121.496883
Case Type:	LUST Cleanup Site
Status:	Open - Eligible for Closure
Status Date:	06/19/2013
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	DVA
Local Agency:	SACRAMENTO COUNTY LOP
RB Case Number:	341444
LOC Case Number:	G076
File Location:	Local Agency
Potential Media Affect:	Under Investigation
Potential Contaminants of Concern:	Gasoline
Site History:	A complete site history is available within several documents already uploaded to GeoTracker website. Please click on the "Site Maps / Documents" tab.

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606797784
Contact Type:	Local Agency Caseworker
Contact Name:	DAVID VON ASPERN
Organization Name:	SACRAMENTO COUNTY LOP
Address:	10590 ARMSTRONG AVENUE, SUITE A
City:	MATHER
Email:	vonaspernd@saccounty.net
Phone Number:	Not reported

Global Id:	T0606797784
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Status History:

Global Id:	T0606797784
Status:	Open - Site Assessment
Status Date:	02/10/2005

Global Id:	T0606797784
Status:	Open - Case Begin Date
Status Date:	09/24/1998

Global Id:	T0606797784
Status:	Open - Eligible for Closure
Status Date:	06/19/2013

SCHETTER ELECTRIC (Continued) **S103706822**

Regulatory Activities:

Global Id:	T0606797784
Action Type:	ENFORCEMENT
Date:	02/10/2005
Action:	Notice of Responsibility
Global Id:	T0606797784
Action Type:	ENFORCEMENT
Date:	01/04/2006
Action:	Technical Correspondence / Assistance / Other
Global Id:	T0606797784
Action Type:	Other
Date:	09/24/1998
Action:	Leak Discovery
Global Id:	T0606797784
Action Type:	ENFORCEMENT
Date:	07/19/2005
Action:	File review
Global Id:	T0606797784
Action Type:	ENFORCEMENT
Date:	09/16/2011
Action:	File review
Global Id:	T0606797784
Action Type:	Other
Date:	02/10/2005
Action:	Leak Reported
Global Id:	T0606797784
Action Type:	ENFORCEMENT
Date:	03/03/2010
Action:	Technical Correspondence / Assistance / Other
Global Id:	T0606797784
Action Type:	ENFORCEMENT
Date:	03/31/2009
Action:	Technical Correspondence / Assistance / Other

Sacramento Co. CS:

State Site Number:	G076
Lead Staff:	Abad, C.
Lead Agency:	HM
Remedial Action Taken:	NO
Substance:	Not reported
Date Reported:	Not reported
Facility Id:	RO0001577
Case Type:	Drinking Water Aquifer affected
Case Closed:	Not reported
Date Closed:	**Not reported**

Sacramento Co. ML:

Facility Id:	Not reported

SCHETTER ELECTRIC (Continued) **S103706822**

Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	A
Billing Codes UST:	A
WG Bill Code:	A
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	1
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AJ247 **SHERIFF ADM BLDG** **CA HIST CORTESE** **S100872869**
ESE **711 G ST** **CA LUST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814** **CA Sacramento Co. CS**
0.337 mi. **CA Sacramento Co. ML**
1780 ft. **Site 3 of 3 in cluster AJ**

Relative:
Higher

Actual:
26 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	LTNKA
Reg Id:	340212

LUST:

Region:	STATE
Global Id:	T0606700159
Latitude:	38.5845577
Longitude:	-121.4956272
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	09/09/1986
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	Not reported
Local Agency:	Not reported
RB Case Number:	340212
LOC Case Number:	R081
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606700159
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)

SHERIFF ADM BLDG (Continued) **S100872869**

Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: vera.fischer@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0606700159
Status: Open - Case Begin Date
Status Date: 01/08/1986

Global Id: T0606700159
Status: Completed - Case Closed
Status Date: 09/09/1986

Regulatory Activities:
Global Id: T0606700159
Action Type: Other
Date: 01/08/1986
Action: Leak Discovery

Global Id: T0606700159
Action Type: Other
Date: 01/08/1986
Action: Leak Reported

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 340212
Case Type: Soil only
Substance: GASOLINE
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

Sacramento Co. CS:
State Site Number: R081
Lead Staff: None assigned, H.
Lead Agency: HM
Remedial Action Taken: NO
Substance: Automotive(motor gasoline and additives)
Date Reported: Not reported
Facility Id: RO0000577
Case Type: Not reported
Case Closed: Y
Date Closed: Not reported

Sacramento Co. ML:
Facility Id: Not reported
Facility Status: Not reported
FD: Not reported
Billing Codes BP: Not reported
Billing Codes UST: I

SHERIFF ADM BLDG (Continued) **S100872869**

WG Bill Code:	I
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	1
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	I
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AK248 **MATHESON FAST FREIGHT** **CA NPDES** **S104586326**
NE **455 BANNON ST** **CA HIST CORTESE** **N/A**
1/4-1/2 **SACRAMENTO, CA 95841** **CA LUST**
0.339 mi. **CA Sacramento Co. CS**
1792 ft. **Site 3 of 3 in cluster AK** **CA Sacramento Co. ML**
CA WDS

Relative:
Higher

Actual:
25 ft.

NPDES:

Npdes Number:	CAS000001
Facility Status:	Active
Agency Id:	0
Region:	5S
Regulatory Measure Id:	200696
Order No:	97-03-DWQ
Regulatory Measure Type:	Enrollee
Place Id:	Not reported
WDID:	5S34I005912
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	04/16/1992
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Matheson Postal Services
Discharge Address:	9785 Geothe Rd
Discharge City:	Sacramento
Discharge State:	California
Discharge Zip:	95827

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	LTNKA
Reg Id:	341236

LUST:

Region:	STATE
Global Id:	T0606701060
Latitude:	38.5941619
Longitude:	-121.4971925
Case Type:	LUST Cleanup Site

MATHESON FAST FREIGHT (Continued) **S104586326**

Status:	Open - Site Assessment
Status Date:	02/23/1999
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	DVA
Local Agency:	SACRAMENTO COUNTY LOP
RB Case Number:	341236
LOC Case Number:	D550
File Location:	Local Agency
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Diesel
Site History:	History will be added once site is in compliance with Geotracker upload requirements.

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606701060
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0606701060
Contact Type:	Local Agency Caseworker
Contact Name:	DAVID VON ASPERN
Organization Name:	SACRAMENTO COUNTY LOP
Address:	10590 ARMSTRONG AVENUE, SUITE A
City:	MATHER
Email:	vonaspernd@saccounty.net
Phone Number:	Not reported

Status History:

Global Id:	T0606701060
Status:	Open - Case Begin Date
Status Date:	02/23/1999

Global Id:	T0606701060
Status:	Open - Site Assessment
Status Date:	02/23/1999

Regulatory Activities:

Global Id:	T0606701060
Action Type:	Other
Date:	02/23/1999
Action:	Leak Discovery

Global Id:	T0606701060
Action Type:	ENFORCEMENT
Date:	09/16/2011
Action:	File review

Global Id:	T0606701060
Action Type:	ENFORCEMENT
Date:	08/18/1999

MATHESON FAST FREIGHT (Continued) **S104586326**

Action: Staff Letter

Global Id: T0606701060
Action Type: Other
Date: 02/23/1999
Action: Leak Reported

Global Id: T0606701060
Action Type: ENFORCEMENT
Date: 03/29/1999
Action: Notice of Responsibility

Global Id: T0606701060
Action Type: RESPONSE
Date: 08/01/1999
Action: Preliminary Site Assessment Workplan

Global Id: T0606701060
Action Type: RESPONSE
Date: 10/15/1999
Action: Site Assessment Report

Global Id: T0606701060
Action Type: ENFORCEMENT
Date: 02/23/1999
Action: File review

Global Id: T0606701060
Action Type: ENFORCEMENT
Date: 01/05/2009
Action: File review

LUST REG 5:
Region: 5
Status: Leak being confirmed
Case Number: 341236
Case Type: Soil only
Substance: DIESEL
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

Sacramento Co. CS:
State Site Number: D550
Lead Staff: Von Aspern, D.
Lead Agency: HM
Remedial Action Taken: YE, S
Substance: Diesel
Date Reported: 02/23/1999
Facility Id: RO0001268
Case Type: Other ground water affected
Case Closed: Not reported
Date Closed: Not reported

MATHESON FAST FREIGHT (Continued) **S104586326**

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	A
Billing Codes UST:	I
WG Bill Code:	I
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	2
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

Facility Id:	U0045786
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	03/15/1996
HAZMAT Inspection Date:	02/08/1995
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	12/08/1995
UST Tank Test Date:	06/21/1996
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

WDS:

Facility ID:	5S 34I005912
Facility Type:	Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Status:	Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number:	CAS000001 The 1st 2 characters designate the state. The remaining 7

MATHESON FAST FREIGHT (Continued) **S104586326**

	are assigned by the Regional Board
Subregion:	0
Facility Telephone:	9164466363
Facility Contact:	PRATT STEVE
Agency Name:	MATHESON ROBERT B
Agency Address:	PO Box 970
Agency City,St,Zip:	Elk Grove 957590970
Agency Contact:	LOCKHART LARRY
Agency Telephone:	9166852330
Agency Type:	Private
SIC Code:	0
SIC Code 2:	Not reported
Primary Waste Type:	Not reported
Primary Waste:	Not reported
Waste Type2:	Not reported
Waste2:	Not reported
Primary Waste Type:	Not reported
Secondary Waste:	Not reported
Secondary Waste Type:	Not reported
Design Flow:	0
Baseline Flow:	0
Reclamation:	Not reported
POTW:	Not reported
Treat To Water:	Minor Threat to Water Quality. A violation of a regional board order should cause a relatively minor impairment of beneficial uses compared to a major or minor threat. Not: All nurds without a TTWQ will be considered a minor threat to water quality unless coded at a higher Level. A Zero (0) may be used to code those NURDS that are found to represent no threat to water quality.
Complexity:	Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds.

AL249 **THE SACRAMENTO UNION** **CA SLIC** **U001615211**
South **301 CAPITOL MALL** **CA HIST UST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814**
0.345 mi.
1823 ft. **Site 1 of 2 in cluster AL**

Relative:
Higher

Actual:
33 ft.

SLIC:

Region:	STATE
Facility Status:	**Open - Inactive**
Status Date:	11/06/2004
Global Id:	SL0606737129
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	Not reported
Latitude:	38.57987
Longitude:	-121.503261
Case Type:	Cleanup Program Site
Case Worker:	ZZZ
Local Agency:	Not reported
RB Case Number:	Not reported
File Location:	Not reported
Potential Media Affected:	Not reported
Potential Contaminants of Concern:	Waste Oil / Motor / Hydraulic / Lubricating, Diesel

THE SACRAMENTO UNION (Continued) **U001615211**

Site History: Not reported

Click here to access the California GeoTracker records for this facility:

HIST UST:
Region: STATE
Facility ID: 00000046374
Facility Type: Other
Other Type: NEWSPAPER
Contact Name: ALAN D. EWEN, PRESIDENT
Telephone: 9164427811
Owner Name: RICHARD M. SCAIFE, MELLON BANK
Owner Address: 525 WILLIAM PENN PLACE, 39TH F
Owner City,St,Zip: PITTSBURGH, PA 15219
Total Tanks: 0001

Tank Num: 001
Container Num: H-293257
Year Installed: 1977
Tank Capacity: 00012000
Tank Used for: PRODUCT
Type of Fuel: UNLEADED
Container Construction Thickness: .25
Leak Detection: Visual, Stock Inventor

AL250 **CAPITOL GATEWAY** **CA SLIC** **S105892106**
South **301 CAPITOL MALL** **N/A**
1/4-1/2 **SACRAMENTO, CA**
0.345 mi.
1823 ft. **Site 2 of 2 in cluster AL**

Relative:
Higher

Actual:
33 ft.

SLIC REG 5:
Region: 5
Facility Status: Preliminary Assessment
Unit: Facility is a Spill or site
Pollutant: TPHmo, TPGd Ethanol
Lead Agency: Not reported
Date Filed: / /
Report Date: 10/19/04
Date Added: Not reported
Date Closed: Not reported

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251 **BECHER, ROBERT W. & MARLE** **CA HIST CORTESE** **S105027364**
West **930 CASSELMAN** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95605**
0.348 mi.
1839 ft.

Relative:
Higher

Actual:
18 ft.

HIST CORTESE:
Region: CORTESE
Facility County Code: 18
Reg By: WBC&D
Reg Id: 6A189011N34

Region: CORTESE
Facility County Code: 18

BECHER, ROBERT W. & MARLE (Continued) **S105027364**

Reg By: WBC&D
Reg Id: 6A189011N35

Region: CORTESE
Facility County Code: 18
Reg By: WBC&D
Reg Id: 6A189011N36

AM252 **RALEY'S LANDING/PARRISH ARCO** **CA LUST** **S104403933**
SW **490 WEST CAPITOL AVE** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.350 mi.
1848 ft. **Site 1 of 2 in cluster AM**

Relative:
Higher

Actual:
27 ft.

LUST:
Region: STATE
Global Id: T0611300078
Latitude: 38.582642
Longitude: -121.513608
Case Type: LUST Cleanup Site
Status: Completed - Case Closed
Status Date: 07/02/1991
Lead Agency: YOLO COUNTY
Case Worker: Not reported
Local Agency: Not reported
RB Case Number: 570108
LOC Case Number: Not reported
File Location: Not reported
Potential Media Affect: Aquifer used for drinking water supply
Potential Contaminants of Concern: Gasoline
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0611300078
Contact Type: Regional Board Caseworker
Contact Name: DAVID STAVAREK
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: dstavarek@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0611300078
Status: Open - Case Begin Date
Status Date: 01/16/1989

Global Id: T0611300078
Status: Open - Site Assessment
Status Date: 05/04/1990

Global Id: T0611300078
Status: Completed - Case Closed
Status Date: 07/02/1991

RALEY'S LANDING/PARRISH ARCO (Continued) **S104403933**

Regulatory Activities:

Global Id:	T0611300078
Action Type:	ENFORCEMENT
Date:	07/02/1991
Action:	State Water Board Closure Order
Global Id:	T0611300078
Action Type:	Other
Date:	10/16/1989
Action:	Leak Discovery
Global Id:	T0611300078
Action Type:	Other
Date:	01/16/1989
Action:	Leak Stopped
Global Id:	T0611300078
Action Type:	Other
Date:	03/22/1990
Action:	Leak Reported

LUST REG 5:

Region:	5
Status:	Case Closed
Case Number:	570108
Case Type:	Drinking Water Aquifer affected
Substance:	UNLEAD GASOLINE
Staff Initials:	DFS
Lead Agency:	Local
Program:	LUST
MTBE Code:	N/A

AN253 **STERLING TRANSIT** **CA HIST CORTESE** **S102438105**
WSW **832 F ST** **CA LUST** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691** **CA WDS**
0.350 mi.
1849 ft. **Site 1 of 3 in cluster AN**

Relative:
Higher

Actual:
26 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	57
Reg By:	LTNKA
Reg Id:	570107

LUST:

Region:	STATE
Global Id:	T0611300077
Latitude:	38.586236
Longitude:	-121.519337
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	01/30/1998
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	DFS
Local Agency:	Not reported

STERLING TRANSIT (Continued) **S102438105**

RB Case Number: 570107
LOC Case Number: Not reported
File Location: Not reported
Potential Media Affect: Aquifer used for drinking water supply
Potential Contaminants of Concern: Diesel
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0611300077
Contact Type: Regional Board Caseworker
Contact Name: DAVID STAVAREK
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: dstavarek@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0611300077
Status: Completed - Case Closed
Status Date: 01/30/1998

Global Id: T0611300077
Status: Open - Case Begin Date
Status Date: 01/03/1990

Global Id: T0611300077
Status: Open - Remediation
Status Date: 06/11/1990

Global Id: T0611300077
Status: Open - Site Assessment
Status Date: 04/09/1996

Regulatory Activities:
Global Id: T0611300077
Action Type: ENFORCEMENT
Date: 01/30/1998
Action: Closure/No Further Action Letter

Global Id: T0611300077
Action Type: Other
Date: 01/03/1990
Action: Leak Discovery

Global Id: T0611300077
Action Type: Other
Date: 01/03/1990
Action: Leak Stopped

Global Id: T0611300077
Action Type: Other
Date: 03/14/1990
Action: Leak Reported

STERLING TRANSIT (Continued) **S102438105**

Global Id: T0611300077
Action Type: RESPONSE
Date: 12/08/2009
Action: Verbal Communication

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 570107
Case Type: Drinking Water Aquifer affected
Substance: DIESEL
Staff Initials: DFS
Lead Agency: Regional
Program: LUST
MTBE Code: N/A

WDS:
Facility ID: 5S 57I018056
Facility Type: Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Status: Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number: CAS000001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board
Subregion: 0
Facility Telephone: 9163735380
Facility Contact: MACK DENNIS
Agency Name: CONDOR FREIGHT LINES
Agency Address: 2720 E 25TH ST
Agency City,St,Zip: LOS ANGELES 90023
Agency Contact: CRITES WILLIAM D
Agency Telephone: 3232681791
Agency Type: Private
SIC Code: 0
SIC Code 2: Not reported
Primary Waste Type: Not reported
Primary Waste: Not reported
Waste Type2: Not reported
Waste2: Not reported
Primary Waste Type: Not reported
Secondary Waste: Not reported
Secondary Waste Type: Not reported
Design Flow: 0
Baseline Flow: 0
Reclamation: Not reported
POTW: Not reported
Treat To Water: Minor Threat to Water Quality. A violation of a regional board order should cause a relatively minor impairment of beneficial uses compared to a major or minor threat. Not: All nurds without a TTWQ will be considered a minor threat to water quality unless coded at a higher Level. A Zero (0) may be used to code those NURDS that are found to

STERLING TRANSIT (Continued) **S102438105**

represent no threat to water quality.

Complexity: Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds.

AM254 **RALEY'S LANDING/PARRISH A** **CA HIST CORTESE** **S105027361**
SW **490 CAPITOL** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95606**
0.350 mi.
1849 ft. **Site 2 of 2 in cluster AM**

Relative:
Higher

Actual:
27 ft.

HIST CORTESE:
Region: CORTESE
Facility County Code: 57
Reg By: LTNKA
Reg Id: 570108

AO255 **CARDLUCK SITE (CASE # 2)** **CA HIST CORTESE** **S103427246**
NNE **300 RICHARDS BLVD** **CA LUST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814** **CA Sacramento Co. CS**
0.353 mi. **CA Sacramento Co. ML**
1864 ft. **Site 1 of 3 in cluster AO**

Relative:
Higher

Actual:
26 ft.

HIST CORTESE:
Region: CORTESE
Facility County Code: 34
Reg By: LTNKA
Reg Id: 340363

LUST:
Region: STATE
Global Id: T0606791997
Latitude: 38.596984
Longitude: -121.49938
Case Type: LUST Cleanup Site
Status: Completed - Case Closed
Status Date: 02/05/1990
Lead Agency: SACRAMENTO COUNTY LOP
Case Worker: Not reported
Local Agency: Not reported
RB Case Number: 341377
LOC Case Number: R210
File Location: Not reported
Potential Media Affect: Soil
Potential Contaminants of Concern: Gasoline
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0606791997
Contact Type: Regional Board Caseworker
Contact Name: VERA FISCHER

CARDLUCK SITE (CASE # 2) (Continued) **S103427246**

Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: vera.fischer@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0606791997
Status: Open - Case Begin Date
Status Date: 12/01/1988

Global Id: T0606791997
Status: Completed - Case Closed
Status Date: 02/05/1990

Regulatory Activities:
Global Id: T0606791997
Action Type: Other
Date: 12/01/1988
Action: Leak Discovery

Global Id: T0606791997
Action Type: Other
Date: 12/14/1988
Action: Leak Reported

Region: STATE
Global Id: T0606700294
Latitude: 38.5970938
Longitude: -121.5021096
Case Type: LUST Cleanup Site
Status: Completed - Case Closed
Status Date: 02/05/1990
Lead Agency: SACRAMENTO COUNTY LOP
Case Worker: Not reported
Local Agency: Not reported
RB Case Number: 340363
LOC Case Number: C226
File Location: Not reported
Potential Media Affect: Soil
Potential Contaminants of Concern: Gasoline
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0606700294
Contact Type: Regional Board Caseworker
Contact Name: VERA FISCHER
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: vera.fischer@waterboards.ca.gov
Phone Number: Not reported

CARDLUCK SITE (CASE # 2) (Continued) **S103427246**

Status History:

Global Id:	T0606700294
Status:	Open - Case Begin Date
Status Date:	12/01/1988
Global Id:	T0606700294
Status:	Completed - Case Closed
Status Date:	02/05/1990
Global Id:	T0606700294
Status:	Open - Site Assessment
Status Date:	12/14/1988

Regulatory Activities:

Global Id:	T0606700294
Action Type:	Other
Date:	12/01/1988
Action:	Leak Discovery
Global Id:	T0606700294
Action Type:	Other
Date:	01/02/1965
Action:	Leak Reported

Sacramento Co. CS:

State Site Number:	R120
Lead Staff:	None assigned, H.
Lead Agency:	HM
Remedial Action Taken:	NO
Substance:	Automotive(motor gasoline and additives)
Date Reported:	05/05/1989
Facility Id:	RO0001002
Case Type:	Not reported
Case Closed:	Y
Date Closed:	**Not reported**
State Site Number:	C226
Lead Staff:	Marcus, B.
Lead Agency:	HM
Remedial Action Taken:	NO
Substance:	Automotive(motor gasoline and additives)
Date Reported:	01/19/1998
Facility Id:	RO0001003
Case Type:	Soil only
Case Closed:	Y
Date Closed:	**09/25/1998**

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	A
Billing Codes UST:	Not reported
WG Bill Code:	I

CARDLUCK SITE (CASE # 2) (Continued) **S103427246**

Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

Facility Id:	U0031186
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	02/02/1988
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported

CARDLUCK SITE (CASE # 2) (Continued) **S103427246**

AST Bill Code:	Not reported
CALARP Bill Code:	Not reported
Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Disclaimer
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	50
Food Bill Code:	50
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported
Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AO256 **PACIFIC MOTOR TRUCKING CO** **RCRA NonGen / NLR** **1000250575**
NNE **300 RICHARDS BLVD** **FINDS** **CAD029043171**
1/4-1/2 **SACRAMENTO, CA 95814** **CA LUST**
0.353 mi. **CA FID UST**
1864 ft. **Site 2 of 3 in cluster AO** **CA HIST UST**
CA SWEEPS UST

Relative:
Higher

RCRA NonGen / NLR:

Date form received by agency:	08/15/1980
Facility name:	PACIFIC MOTOR TRUCKING CO
Facility address:	300 RICHARDS BLVD

Actual:
26 ft.

PACIFIC MOTOR TRUCKING CO (Continued) **1000250575**

SACRAMENTO, CA 95814
EPA ID: CAD029043171
Mailing address: RICHARDS BLVD
SACRAMENTO, CA 95814
Contact: ENVIRONMENTAL MANAGER
Contact address: 300 RICHARDS BLVD
SACRAMENTO, CA 95814
Contact country: US
Contact telephone: (916) 444-7866
Contact email: Not reported
EPA Region: 09
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: PACIFIC MOTOR TRUCKING CO
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: (415) 555-1212
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

FINDS:

Registry ID: 110002641455

PACIFIC MOTOR TRUCKING CO (Continued) **1000250575**

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 341377
Case Type: Soil only
Substance: GASOLINE
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

Region: 5
Status: Case Closed
Case Number: 340363
Case Type: Soil only
Substance: GASOLINE
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

CA FID UST:
Facility ID: 34000508
Regulated By: UTNKA
Regulated ID: 00003368
Cortese Code: Not reported
SIC Code: Not reported
Facility Phone: 9164491922
Mail To: Not reported
Mailing Address: 300 RICHARDS BLVD
Mailing Address 2: Not reported
Mailing City,St,Zip: SACRAMENTO 95814
Contact: Not reported
Contact Phone: Not reported
DUNs Number: Not reported
NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Active

HIST UST:
Region: STATE
Facility ID: 00000003368
Facility Type: Other
Other Type: TRUCKING FACILITY
Contact Name: L. A. SLEEPER
Telephone: 9164491922

PACIFIC MOTOR TRUCKING CO (Continued) **1000250575**

Owner Name: PACIFIC MOTOR TRUKING COMPANY
Owner Address: 1766 EL CAMINO REAL
Owner City,St,Zip: BURLNGAME, CA 94010
Total Tanks: 0005

Tank Num: 001
Container Num: 1
Year Installed: 1971
Tank Capacity: 00002000
Tank Used for: PRODUCT
Type of Fuel: Not reported
Container Construction Thickness: Not reported
Leak Detection: Stock Inventor, Pressure Test

Tank Num: 002
Container Num: 2
Year Installed: 1971
Tank Capacity: 00010000
Tank Used for: PRODUCT
Type of Fuel: REGULAR
Container Construction Thickness: Not reported
Leak Detection: Stock Inventor, Pressure Test, 10

Tank Num: 003
Container Num: 3
Year Installed: 1971
Tank Capacity: 00000002
Tank Used for: PRODUCT
Type of Fuel: 06
Container Construction Thickness: Not reported
Leak Detection: Visual, Pressure Test

Tank Num: 004
Container Num: 4
Year Installed: 1971
Tank Capacity: 00005000
Tank Used for: WASTE
Type of Fuel: WASTE OIL
Container Construction Thickness: Not reported
Leak Detection: None

Tank Num: 005
Container Num: 5
Year Installed: 1971
Tank Capacity: 00000508
Tank Used for: WASTE
Type of Fuel: Not reported
Container Construction Thickness: Not reported
Leak Detection: None

SWEEPS UST:
Status: Active
Comp Number: 3368
Number: 9
Board Of Equalization: 44-018725
Referral Date: 07-01-85
Action Date: Not reported

PACIFIC MOTOR TRUCKING CO (Continued) **1000250575**

Created Date:	02-29-88
Owner Tank Id:	1
SWRCB Tank Id:	34-000-003368-000001
Tank Status:	A
Capacity:	2000
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	Not reported
Number Of Tanks:	5

Status:	Active
Comp Number:	3368
Number:	9
Board Of Equalization:	44-018725
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	2
SWRCB Tank Id:	34-000-003368-000002
Tank Status:	A
Capacity:	10000
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	LEADED
Number Of Tanks:	Not reported

Status:	Active
Comp Number:	3368
Number:	9
Board Of Equalization:	44-018725
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	3
SWRCB Tank Id:	34-000-003368-000003
Tank Status:	A
Capacity:	2
Active Date:	07-01-85
Tank Use:	UNKNOWN
STG:	P
Content:	Not reported
Number Of Tanks:	Not reported

Status:	Active
Comp Number:	3368
Number:	9
Board Of Equalization:	44-018725
Referral Date:	07-01-85
Action Date:	Not reported
Created Date:	02-29-88
Owner Tank Id:	4
SWRCB Tank Id:	34-000-003368-000004
Tank Status:	A
Capacity:	5000
Active Date:	07-01-85

PACIFIC MOTOR TRUCKING CO (Continued) **1000250575**

Tank Use: OIL
STG: W
Content: WASTE OIL
Number Of Tanks: Not reported

Status: Active
Comp Number: 3368
Number: 9
Board Of Equalization: 44-018725
Referral Date: 07-01-85
Action Date: Not reported
Created Date: 02-29-88
Owner Tank Id: 5
SWRCB Tank Id: 34-000-003368-000005
Tank Status: A
Capacity: 508
Active Date: 07-01-85
Tank Use: UNKNOWN
STG: W
Content: Not reported
Number Of Tanks: Not reported

AP257 **CONWAY WESTERN EXPRESS, INC.** **CA LUST** **S102428339**
West **900 E ST** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.354 mi.
1870 ft. **Site 1 of 2 in cluster AP**

Relative:
Higher

Actual:
27 ft.

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 570058
Case Type: Drinking Water Aquifer affected
Substance: DIESEL
Staff Initials: DFS
Lead Agency: Regional
Program: LUST
MTBE Code: N/A

AP258 **CONWAY WESTERN EXPRESS, INC.** **CA NPDES** **U003057101**
West **900 E ST** **CA HIST CORTESE** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691** **CA LUST**
0.354 mi.
1870 ft. **Site 2 of 2 in cluster AP**

Relative:
Higher

Actual:
27 ft.

NPDES:
Npdes Number: CAS000001
Facility Status: Active
Agency Id: 0
Region: 5S
Regulatory Measure Id: 203041
Order No: 97-03-DWQ
Regulatory Measure Type: Enrollee
Place Id: Not reported
WDID: 5S57I013618
Program Type: Industrial

CONWAY WESTERN EXPRESS, INC. (Continued) **U003057101**

Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	12/30/1997
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	United Parcel Service Freight
Discharge Address:	2650 S Willow Ave
Discharge City:	Bloomington
Discharge State:	California
Discharge Zip:	92316

HIST CORTESE:

Region:	CORTESE
Facility County Code:	57
Reg By:	LTNKA
Reg Id:	570058

LUST:

Region:	STATE
Global Id:	T0611300037
Latitude:	38.58751
Longitude:	-121.523149
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	03/05/1997
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	DFS
Local Agency:	Not reported
RB Case Number:	570058
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Diesel
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0611300037
Contact Type:	Regional Board Caseworker
Contact Name:	DAVID STAVAREK
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	dstavarek@waterboards.ca.gov
Phone Number:	Not reported

Status History:

Global Id:	T0611300037
Status:	Completed - Case Closed
Status Date:	03/05/1997
Global Id:	T0611300037
Status:	Open - Case Begin Date
Status Date:	04/08/1987
Global Id:	T0611300037

CONWAY WESTERN EXPRESS, INC. (Continued) **U003057101**

Status: Open - Remediation
Status Date: 11/30/1992

Regulatory Activities:
Global Id: T0611300037
Action Type: Other
Date: 04/08/1987
Action: Leak Discovery

Global Id: T0611300037
Action Type: Other
Date: 06/18/1987
Action: Leak Reported

AQ259 **CONTINENTAL CAN CO** **CA HIST CORTESE** **S102428316**
ESE **601 7TH ST N** **CA LUST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814**
0.358 mi.
1889 ft. **Site 1 of 2 in cluster AQ**

Relative:
Higher

Actual:
26 ft.

HIST CORTESE:
Region: CORTESE
Facility County Code: 34
Reg By: LTNKA
Reg Id: 340138

LUST:
Region: STATE
Global Id: T0606700098
Latitude: 38.598025
Longitude: -121.489237
Case Type: LUST Cleanup Site
Status: Completed - Case Closed
Status Date: 04/21/1986
Lead Agency: SACRAMENTO COUNTY LOP
Case Worker: DWB
Local Agency: SACRAMENTO COUNTY LOP
RB Case Number: 340138
LOC Case Number: Not reported
File Location: Not reported
Potential Media Affect: Soil
Potential Contaminants of Concern: Other Solvent or Non-Petroleum Hydrocarbon
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0606700098
Contact Type: Regional Board Caseworker
Contact Name: VERA FISCHER
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: vera.fischer@waterboards.ca.gov
Phone Number: Not reported

CONTINENTAL CAN CO (Continued) **S102428316**

Global Id: T0606700098
Contact Type: Local Agency Caseworker
Contact Name: DANA BOOTH
Organization Name: SACRAMENTO COUNTY LOP
Address: 8475 JACKSON ROAD, SUITE 240
City: SACRAMENTO
Email: boothd@saccounty.net
Phone Number: Not reported

Status History:
Global Id: T0606700098
Status: Open - Case Begin Date
Status Date: 02/20/1986

Global Id: T0606700098
Status: Completed - Case Closed
Status Date: 04/21/1986

Regulatory Activities:
Global Id: T0606700098
Action Type: Other
Date: 02/20/1986
Action: Leak Reported

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 340138
Case Type: Soil only
Substance: HYDROCARBONS
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

AQ260 **COUNTY OF SACRAMENTO** **CA Sacramento Co. CS** **S102425895**
ESE **575 7TH ST** **CA Sacramento Co. ML** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814**
0.363 mi.
1914 ft. **Site 2 of 2 in cluster AQ**

Relative:
Higher

Actual:
27 ft.

Sacramento Co. CS:
State Site Number: R002
Lead Staff: None assigned, H.
Lead Agency: HM
Remedial Action Taken: NO
Substance: Diesel
Date Reported: Not reported
Facility Id: RO0000123
Case Type: Not reported
Case Closed: Y
Date Closed: **Not reported**

Sacramento Co. ML:
Facility Id: Not reported

COUNTY OF SACRAMENTO (Continued) **S102425895**

Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Disclaimer
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	50
Food Bill Code:	50
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	9199
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AO261 **MOTOROLA** **CA HIST CORTESE** **U001615283**
NNE **301 RICHARDS BLVD** **CA LUST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95815** **CA Sacramento Co. CS**
0.366 mi. **CA HIST UST**
1931 ft. **Site 3 of 3 in cluster AO** **CA SWEEPS UST**
CA Sacramento Co. ML

Relative:
Higher

Actual:
26 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	LTNKA
Reg Id:	340323

LUST:

Region:	STATE
Global Id:	T0606700256
Latitude:	38.597684
Longitude:	-121.499564
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	04/05/1989
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	Not reported
Local Agency:	Not reported
RB Case Number:	340323
LOC Case Number:	R121
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606700256
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER

MOTOROLA (Continued) **U001615283**

Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: vera.fischer@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0606700256
Status: Open - Case Begin Date
Status Date: 11/10/1988

Global Id: T0606700256
Status: Completed - Case Closed
Status Date: 04/05/1989

Regulatory Activities:
Global Id: T0606700256
Action Type: Other
Date: 11/10/1988
Action: Leak Discovery

Global Id: T0606700256
Action Type: Other
Date: 12/20/1988
Action: Leak Reported

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 340323
Case Type: Soil only
Substance: GASOLINE
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

Sacramento Co. CS:
State Site Number: R121
Lead Staff: None assigned, H.
Lead Agency: HM
Remedial Action Taken: NO
Substance: Automotive(motor gasoline and additives)
Date Reported: 12/01/1988
Facility Id: RO0001004
Case Type: Not reported
Case Closed: Y
Date Closed: Not reported

HIST UST:
Region: STATE
Facility ID: 00000067424
Facility Type: Other
Other Type: WAREHOUSE

MOTOROLA (Continued) **U001615283**

Contact Name: MYRON TRUEX
Telephone: 9164448500
Owner Name: PEARSON CORPORATION
Owner Address: 1801 CAPITOL AVE. P.O.BOX 1977
Owner City,St,Zip: SACRAMENTO, CA 95809
Total Tanks: 0001

Tank Num: 001
Container Num: 0001
Year Installed: Not reported
Tank Capacity: 00000000
Tank Used for: WASTE
Type of Fuel: 1
Container Construction Thickness: X
Leak Detection: Stock Inventor

SWEEPS UST:
Status: Active
Comp Number: 67424
Number: 9
Board Of Equalization: Not reported
Referral Date: 07-01-85
Action Date: Not reported
Created Date: 02-29-88
Owner Tank Id: 1
SWRCB Tank Id: 34-000-067424-000001
Tank Status: A
Capacity: Not reported
Active Date: 07-01-85
Tank Use: M.V. FUEL
STG: P
Content: REG UNLEADED
Number Of Tanks: 1

Sacramento Co. ML:
Facility Id: Not reported
Facility Status: Inactive. Included on a listing no longer updated.
FD: U
Billing Codes BP: Disclaimer
Billing Codes UST: No Tanks
WG Bill Code: Oil Changed by Outside Company-No Fee
Target Property Bill Cod: 50
Food Bill Code: 50
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: Not reported
UST Permit Dt: Not reported
UST Inspection Date: Not reported
UST Tank Test Date: Not reported
Number of Tanks: 0
UST Tank Test Date: Not reported
SIC Code: Not reported
Tier Permitting: Not reported
AST Bill Code: Not reported
CALARP Bill Code: Not reported

AR262 **HOLIDAY INN** **CA HIST CORTESE** **S103974042**
North **200 JIBBOOM ST** **CA LUST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814** **CA Sacramento Co. ML**
0.374 mi.
1973 ft. **Site 1 of 2 in cluster AR**

Relative:
Higher

Actual:
31 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	LTNKA
Reg Id:	340878

LUST:

Region:	STATE
Global Id:	T0606700725
Latitude:	38.59707
Longitude:	-121.505973
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	05/28/1996
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	DWB
Local Agency:	SACRAMENTO COUNTY LOP
RB Case Number:	340878
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Other Solvent or Non-Petroleum Hydrocarbon
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606700725
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0606700725
Contact Type:	Local Agency Caseworker
Contact Name:	DANA BOOTH
Organization Name:	SACRAMENTO COUNTY LOP
Address:	8475 JACKSON ROAD, SUITE 240
City:	SACRAMENTO
Email:	boothd@saccounty.net
Phone Number:	Not reported

Status History:

Global Id:	T0606700725
Status:	Open - Case Begin Date
Status Date:	08/13/1993

Global Id:	T0606700725
Status:	Completed - Case Closed
Status Date:	05/28/1996

HOLIDAY INN (Continued) **S103974042**

Regulatory Activities:
Global Id: T0606700725
Action Type: Other
Date: 08/13/1993
Action: Leak Reported

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 340878
Case Type: Soil only
Substance: HYDROCARBONS
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

Sacramento Co. ML:
Facility Id: U0066986
Facility Status: Inactive. Included on a listing no longer updated.
FD: U
Billing Codes BP: Disclaimer
Billing Codes UST: No Tanks
WG Bill Code: Oil Changed by Outside Company-No Fee
Target Property Bill Cod: 50
Food Bill Code: 50
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: Not reported
UST Permit Dt: 08/14/1987
UST Inspection Date: 12/29/1989
UST Tank Test Date: 01/05/1990
Number of Tanks: 0
UST Tank Test Date: Not reported
SIC Code: Not reported
Tier Permitting: Not reported
AST Bill Code: Not reported
CALARP Bill Code: Not reported

AS263 **A-B-C CLEANERS** **CA ENVIROSTOR** **S100189381**
SE **1120 7TH STREET** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814**
0.381 mi.
2011 ft. **Site 1 of 2 in cluster AS**

Relative:
Higher

Actual:
25 ft.

ENVIROSTOR:
Facility ID: 34720001
Status: Refer: Other Agency
Status Date: 11/16/1994
Site Code: Not reported
Site Type: Historical
Site Type Detailed: * Historical
Acres: Not reported
NPL: NO

A-B-C CLEANERS (Continued) **S100189381**

Regulatory Agencies: NONE SPECIFIED
Lead Agency: NONE SPECIFIED
Program Manager: Not reported
Supervisor: Referred - Not Assigned
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Not reported
Latitude: 38.57972
Longitude: -121.4977
APN: NONE SPECIFIED
Past Use: NONE SPECIFIED
Potential COC: NONE SPECIFIED
Confirmed COC: NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: 34720001
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: Not reported
Completed Sub Area Name: Not reported
Completed Document Type: Not reported
Completed Date: Not reported
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

AT264 **FEDERAL BUILDING - GSA** **CA HIST CORTESE** **S103672726**
SE **801 I ST** **CA LUST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814** **CA Sacramento Co. CS**
0.382 mi. **CA SWEEPS UST**
2016 ft. **Site 1 of 2 in cluster AT**

Relative:
Higher

Actual:
27 ft.

HIST CORTESE:
Region: CORTESE
Facility County Code: 34
Reg By: LTNKA
Reg Id: 341164

LUST:
Region: STATE
Global Id: T0606700989
Latitude: 38.582347
Longitude: -121.49482
Case Type: LUST Cleanup Site
Status: Completed - Case Closed
Status Date: 01/23/1998

FEDERAL BUILDING - GSA (Continued) **S103672726**

Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	DWB
Local Agency:	SACRAMENTO COUNTY LOP
RB Case Number:	341164
LOC Case Number:	C206
File Location:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Diesel
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606700989
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0606700989
Contact Type:	Local Agency Caseworker
Contact Name:	DANA BOOTH
Organization Name:	SACRAMENTO COUNTY LOP
Address:	8475 JACKSON ROAD, SUITE 240
City:	SACRAMENTO
Email:	boothd@saccounty.net
Phone Number:	Not reported

Status History:

Global Id:	T0606700989
Status:	Completed - Case Closed
Status Date:	01/23/1998

Global Id:	T0606700989
Status:	Open - Case Begin Date
Status Date:	04/30/1988

Global Id:	T0606700989
Status:	Open - Site Assessment
Status Date:	04/30/1988

Regulatory Activities:

Global Id:	T0606700989
Action Type:	Other
Date:	04/30/1988
Action:	Leak Discovery

Global Id:	T0606700989
Action Type:	Other
Date:	01/23/1998
Action:	Leak Reported

FEDERAL BUILDING - GSA (Continued) **S103672726**

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 341164
Case Type: Drinking Water Aquifer affected
Substance: DIESEL
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

Sacramento Co. CS:
State Site Number: C206
Lead Staff: Booth, D.
Lead Agency: HM
Remedial Action Taken: YE, S
Substance: Diesel
Date Reported: 04/08/1997
Facility Id: RO0000637
Case Type: Other ground water affected
Case Closed: Y
Date Closed: 06/05/1998

SWEEPS UST:
Status: Active
Comp Number: 60640
Number: 7
Board Of Equalization: Not reported
Referral Date: 06-30-92
Action Date: 06-30-92
Created Date: 02-29-88
Owner Tank Id: 1
SWRCB Tank Id: 34-000-060640-000001
Tank Status: A
Capacity: 12000
Active Date: 06-30-92
Tank Use: M.V. FUEL
STG: P
Content: DIESEL
Number Of Tanks: 2

Status: Active
Comp Number: 60640
Number: 7
Board Of Equalization: Not reported
Referral Date: 06-30-92
Action Date: 06-30-92
Created Date: 02-29-88
Owner Tank Id: 1
SWRCB Tank Id: 34-000-060640-000002
Tank Status: A
Capacity: 12000
Active Date: 07-01-85
Tank Use: M.V. FUEL
STG: P
Content: DIESEL

FEDERAL BUILDING - GSA (Continued) **S103672726**

Number Of Tanks: Not reported

AT265 **SACTO HOUSING &** **CA Sacramento Co. CS** **S102437508**
SE **917 8TH ST** **CA Sacramento Co. ML** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814**
0.382 mi.
2016 ft. **Site 2 of 2 in cluster AT**

Relative:
Higher

Actual:
28 ft.

Sacramento Co. CS:

State Site Number:	R003
Lead Staff:	Benedict, A.
Lead Agency:	HM
Remedial Action Taken:	NO
Substance:	Automotive(motor gasoline and additives)
Date Reported:	Not reported
Facility Id:	RO0000126
Case Type:	Not reported
Case Closed:	Y
Date Closed:	**Not reported**

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Disclaimer
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	50
Food Bill Code:	50
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AR266 **LA QUINTA INN** **CERCLIS** **1005440846**
North **208 JIBBOOM STREET** **CAN000905644**
1/4-1/2 **SACRAMENTO, CA 95814**
0.385 mi.
2031 ft. **Site 2 of 2 in cluster AR**

Relative:
Higher

Actual:
26 ft.

CERCLIS:

Site ID:	0905644
EPA ID:	CAN000905644
Facility County:	SACRAMENTO
Short Name:	LA QUINTA INN
Congressional District:	Not reported
IFMS ID:	Not reported

LA QUINTA INN (Continued) **1005440846**

SMSA Number: Not reported
USGC Hydro Unit: Not reported
Federal Facility: Not a Federal Facility
DMNSN Number: 0.00000
Site Orphan Flag: Not reported
RCRA ID: Not reported
USGS Quadrangle: Not reported
Site Init By Prog: S
NFRAP Flag: Not reported
Parent ID: Not reported
RST Code: Not reported
EPA Region: 09
Classification: Not reported
Site Settings Code: Not reported
NPL Status: Not on the NPL
DMNSN Unit Code: Not reported
RBRAC Code: Not reported
RResp Fed Agency Code: Not reported
Non NPL Status: Removal Only Site (No Site Assessment Work Needed)
Non NPL Status Date: 01/10/02
Site Fips Code: 06067
CC Concurrence Date: / /
CC Concurrence FY: Not reported
Alias EPA ID: Not reported
Site FUDS Flag: Not reported

CERCLIS Site Contact Name(s):
Contact ID: 13003854.00000
Contact Name: Leslie Ramirez
Contact Tel: (415) 972-3978
Contact Title: Site Assessment Manager (SAM)
Contact Email: Not reported

Contact ID: 13003858.00000
Contact Name: Sharon Murray
Contact Tel: (415) 972-4250
Contact Title: Site Assessment Manager (SAM)
Contact Email: Not reported

Contact ID: 13004003.00000
Contact Name: Carl Brickner
Contact Tel: Not reported
Contact Title: Site Assessment Manager (SAM)
Contact Email: Not reported

CERCLIS Site Alias Name(s):
Alias ID: 101
Alias Name: CALIFORNIA ZONOLITE CO/WR GRACE
Alias Address: 208 JIBBOOM STREET
SACRAMENTO, CA 95814
Alias Comments: Not reported
Site Description: Not reported

CERCLIS Assessment History:

Action Code: 001
Action: PRE-CERCLIS SCREENING

LA QUINTA INN (Continued) **1005440846**

Date Started: / /
Date Completed: 08/03/00
Priority Level: Not reported
Operable Unit: SITEWIDE
Primary Responsibility: EPA Fund-Financed
Planning Status: Not reported
Urgency Indicator: Not reported
Action Anomaly: Not reported

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267 **TOWER COURT** **CA VCP** **S109348566**
SW **706 WEST CAPITAL AVENUE** **CA ENVIROSTOR** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95695**
0.386 mi.
2036 ft.

Relative:
Higher

Actual:
26 ft.

VCP:
Facility ID: 60000968
Site Type: Voluntary Cleanup
Site Type Detail: Voluntary Cleanup
Site Mgmt. Req.: NONE SPECIFIED
Acres: 3.52
National Priorities List: NO
Cleanup Oversight Agencies: SMBRP, YOLO COUNTY
Lead Agency: SMBRP
Lead Agency Description: DTSC - Site Cleanup Program
Project Manager: Tami Trearse
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Site Code: 101980
Assembly: 07
Senate: 03
Special Programs Code: Voluntary Cleanup Program
Status: Inactive - Action Required
Status Date: 09/15/2014
Restricted Use: NO
Funding: Responsible Party
Lat/Long: 38.58222 / -121.5172
APN: NONE SPECIFIED
Past Use: ILLEGAL DUMPING
Potential COC: 30013
Confirmed COC: 30013
Potential Description: SOIL
Alias Name: 101980
Alias Type: Project Code (Site Code)
Alias Name: 60000968
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 03/02/2011
Comments: NOE went final on March 2, 2011. No comments were received during the public comment period.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

TOWER COURT (Continued) **S109348566**

Completed Document Type: Environmental Oversight Agreement
Completed Date: 01/23/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement Application
Completed Date: 10/09/2008
Comments: Tower Court EOA Application

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 03/18/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Workplan
Completed Date: 12/03/2009
Comments: Workplan accepted, field work will be completed on December 4, 2009.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Community Profile
Completed Date: 03/10/2011
Comments: Community Profile finalized on February 21, 2011.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fact Sheets
Completed Date: 02/09/2011
Comments: Fact Sheet was completed and send out in front of RAW and publi ccomment period which began on February 2, 2011

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 02/01/2011
Comments: Admin Record completed and uploaded to Envirostor

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Notice
Completed Date: 02/26/2011
Comments: Display ad for RAW comment period

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Removal Action Completion Report
Future Due Date: 2016
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

TOWER COURT (Continued) **S109348566**

ENVIROSTOR:
Facility ID: 60000968
Status: Inactive - Action Required
Status Date: 09/15/2014
Site Code: 101980
Site Type: Voluntary Cleanup
Site Type Detailed: Voluntary Cleanup
Acres: 3.52
NPL: NO
Regulatory Agencies: SMBRP, YOLO COUNTY
Lead Agency: SMBRP
Program Manager: Tami Trearse
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 03
Special Program: Voluntary Cleanup Program
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.58222
Longitude: -121.5172
APN: NONE SPECIFIED
Past Use: ILLEGAL DUMPING
Potential COC: Lead
Confirmed COC: Lead
Potential Description: SOIL
Alias Name: 101980
Alias Type: Project Code (Site Code)
Alias Name: 60000968
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 03/02/2011
Comments: NOE went final on March 2, 2011. No comments were received during the public comment period.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 01/23/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement Application
Completed Date: 10/09/2008
Comments: Tower Court EOA Application

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 03/18/2011
Comments: Not reported

TOWER COURT (Continued) **S109348566**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Workplan
Completed Date: 12/03/2009
Comments: Workplan accepted, field work will be completed on December 4, 2009.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Community Profile
Completed Date: 03/10/2011
Comments: Community Profile finalized on February 21, 2011.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fact Sheets
Completed Date: 02/09/2011
Comments: Fact Sheet was completed and send out in front of RAW and publi ccomment period which began on February 2, 2011

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 02/01/2011
Comments: Admin Record completed and uploaded to Envirostor

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Notice
Completed Date: 02/26/2011
Comments: Display ad for RAW comment period

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Removal Action Completion Report
Future Due Date: 2016
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

AN268 **WILLIG FREIGHT LINES** **CA LUST U004004462**
WSW **850 F ST** **CA UST N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.389 mi.
2053 ft. **Site 2 of 3 in cluster AN**

Relative:
Higher

Actual:
26 ft.

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 570137
Case Type: Drinking Water Aquifer affected
Substance: GASOLINE
Staff Initials: DFS
Lead Agency: Regional
Program: LUST
MTBE Code: N/A

WILLIG FREIGHT LINES (Continued) **U004004462**

YOLO CO. UST:

Facility Id:	FA0000420
Owner Id:	OW0000337
Owner Name:	WILLIG FREIGHT LINES
Owner Address:	3251 JACUZZI STREET
Owner City/State/Zip:	RICHMOND, CA 94804
Billing Name:	WILLIG FREIGHT LINES
Billing Address1:	3251 JACUZZI STREET
Billing City/State/Zip:	RICHMOND, CA 94804
Contact Name:	LUJANO, ALEC
Contact Phone:	916-371-1220, 916-624-3926
Current Status:	Inactive, non-billable
Program Element:	2306 - UST PERMANENT CLOSURE PERMIT
Business Code:	09 - UNKNOWN
Business Type:	6 - OTHER

Tank Number:	3
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	12,000
Product Type:	Diesel
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	10/31/92
INVGEN:	1992000420

Tank Number:	4
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	12,000
Product Type:	Diesel
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	10/31/92
INVGEN:	1992000420

Tank Number:	5
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	12,000
Product Type:	Diesel
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	10/31/92
INVGEN:	1992000420

Tank Number:	6
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	12,000
Product Type:	Diesel
Leak Detection Number:	Not reported
LEA Id:	Not reported

WILLIG FREIGHT LINES (Continued) **U004004462**

Surcharge Year:	10/31/92
INVGEN:	1992000420
Tank Number:	7
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	1,000
Product Type:	Other
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	10/31/92
INVGEN:	1992000420
Tank Number:	8
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	1,000
Product Type:	Used Oil
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	10/31/92
INVGEN:	1992000420
Tank Number:	1
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	2,000
Product Type:	Diesel
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	10/31/92
INVGEN:	1992000420
Tank Number:	2
Tank Status:	Inactive
Tank Type:	Petroleum
Tank Description:	DOUBLE-WALL
Tank Capacity:	10,000
Product Type:	Diesel
Leak Detection Number:	Not reported
LEA Id:	Not reported
Surcharge Year:	10/31/92
INVGEN:	1992000420

AN269 **WILLIG FREIGHT LINES** **CA NPDES** **S101309963**
WSW **850 F ST** **CA HIST CORTESE** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691** **CA LUST**
0.389 mi.
2053 ft. **Site 3 of 3 in cluster AN**

Relative:
Higher

Actual:
26 ft.

NPDES:

Npdes Number:	CAS000001
Facility Status:	Active
Agency Id:	0
Region:	5S

WILLIG FREIGHT LINES (Continued) **S101309963**

Regulatory Measure Id:	203064
Order No:	97-03-DWQ
Regulatory Measure Type:	Enrollee
Place Id:	Not reported
WDID:	5S57I016940
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	11/26/2001
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Best Overnite Express
Discharge Address:	850 F St
Discharge City:	West Sacramento
Discharge State:	California
Discharge Zip:	95691

HIST CORTESE:

Region:	CORTESE
Facility County Code:	57
Reg By:	LTNKA
Reg Id:	570137

LUST:

Region:	STATE
Global Id:	T0611300103
Latitude:	38.586356
Longitude:	-121.520778
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	10/14/1998
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	DFS
Local Agency:	Not reported
RB Case Number:	570137
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0611300103
Contact Type:	Regional Board Caseworker
Contact Name:	DAVID STAVAREK
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	dstavarek@waterboards.ca.gov
Phone Number:	Not reported

Status History:

Global Id:	T0611300103
Status:	Completed - Case Closed
Status Date:	10/14/1998

WILLIG FREIGHT LINES (Continued) **S101309963**

Global Id: T0611300103
Status: Open - Case Begin Date
Status Date: 04/22/1994

Global Id: T0611300103
Status: Open - Site Assessment
Status Date: 05/27/1994

Global Id: T0611300103
Status: Open - Site Assessment
Status Date: 06/27/1994

Regulatory Activities:
Global Id: T0611300103
Action Type: Other
Date: 04/22/1994
Action: Leak Discovery

Global Id: T0611300103
Action Type: ENFORCEMENT
Date: 10/14/1998
Action: Closure/No Further Action Letter

Global Id: T0611300103
Action Type: Other
Date: 05/27/1994
Action: Leak Reported

270
SSE
1/4-1/2
0.390 mi.
2060 ft.

WELLS FARGO BANK
500 CAPITOL MALL
SACRAMENTO, CA

CA Sacramento Co. CS **S104970688**
N/A

Relative:
Higher

Actual:
29 ft.

Sacramento Co. CS:
State Site Number: F567
Lead Staff: Booth, D.
Lead Agency: Not reported
Remedial Action Taken: NO
Substance: Automotive(motor gasoline and additives)
Date Reported: 08/18/2000
Facility Id: RO0001431
Case Type: Other ground water affected
Case Closed: Y
Date Closed: 05/16/2001

271
West
1/4-1/2
0.391 mi.
2065 ft.

CABRERAS RECYCLING
737 SACRAMENTO AVE
WEST SACRAMENTO, CA 95605

CA SWRCY **S110499688**
N/A

Relative:
Higher

Actual:
18 ft.

SWRCY:

Reg Id:	130485
Cert Id:	RC14901
Mailing Address:	7709 Dixie Lou St
Mailing City:	Sacramento
Mailing State:	CA
Mailing Zip Code:	95832
Website:	Not reported
Email:	Not reported
Phone Number:	(916) 265-8697
Grand Father:	N
Rural:	N
Operation Begin Date:	08/02/2010
Aluminium:	Y
Glass:	Y
Plastic:	Y
Bimetal:	Y
Agency:	N/A
Monday Hours Of Operation:	9:00 am - 5:00 pm
Tuesday Hours Of Operation:	9:00 am - 5:00 pm
Wednesday Hours Of Operation:	9:00 am - 5:00 pm
Thursday Hours Of Operation:	9:00 am - 5:00 pm
Friday Hours Of Operation:	9:00 am - 5:00 pm
Saturday Hours Of Operation:	9:00 am - 5:00 pm
Sunday Hours Of Operation:	9:00 am - 5:00 pm
Organization ID:	64333
Organization Name:	Cabreras Recycling

272
South
1/4-1/2
0.399 mi.
2109 ft.

LOT X CITY OF SACRAMENTO PROPERTY
0 N ST
SACRAMENTO, CA

CA LUST **S108484716**
CA Sacramento Co. CS **N/A**

Relative:
Higher

Actual:
32 ft.

LUST:

Region:	STATE
Global Id:	T0606716751
Latitude:	38.579074337
Longitude:	-121.50536275
Case Type:	LUST Cleanup Site
Status:	Open - Site Assessment
Status Date:	04/17/2007
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	DVA
Local Agency:	SACRAMENTO COUNTY LOP
RB Case Number:	341482
LOC Case Number:	G091
File Location:	Local Agency
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Other Solvent or Non-Petroleum Hydrocarbon
Site History:	A complete site history is available within several documents already uploaded to GeoTracker website. Please click on the "Site Maps / Documents" tab.

LOT X CITY OF SACRAMENTO PROPERTY (Continued) **S108484716**

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606716751
Contact Type:	Local Agency Caseworker
Contact Name:	DAVID VON ASPERN
Organization Name:	SACRAMENTO COUNTY LOP
Address:	10590 ARMSTRONG AVENUE, SUITE A
City:	MATHER
Email:	vonaspernd@saccounty.net
Phone Number:	Not reported

Global Id:	T0606716751
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Status History:

Global Id:	T0606716751
Status:	Open - Site Assessment
Status Date:	04/17/2007

Global Id:	T0606716751
Status:	Open - Case Begin Date
Status Date:	04/17/2007

Regulatory Activities:

Global Id:	T0606716751
Action Type:	Other
Date:	04/17/2007
Action:	Leak Discovery

Global Id:	T0606716751
Action Type:	RESPONSE
Date:	03/25/2010
Action:	Monitoring Report - Annually

Global Id:	T0606716751
Action Type:	RESPONSE
Date:	09/18/2008
Action:	Monitoring Report - Annually

Global Id:	T0606716751
Action Type:	REMEDIATION
Date:	04/17/2007
Action:	Not reported

Global Id:	T0606716751
Action Type:	ENFORCEMENT
Date:	09/15/2011
Action:	File review

LOT X CITY OF SACRAMENTO PROPERTY (Continued) **S108484716**

Global Id:	T0606716751
Action Type:	RESPONSE
Date:	05/23/2011
Action:	Monitoring Report - Annually
Global Id:	T0606716751
Action Type:	Other
Date:	04/17/2007
Action:	Leak Reported
Global Id:	T0606716751
Action Type:	RESPONSE
Date:	05/06/2014
Action:	Monitoring Report - Annually
Global Id:	T0606716751
Action Type:	ENFORCEMENT
Date:	03/31/2009
Action:	Technical Correspondence / Assistance / Other

Sacramento Co. CS:

State Site Number:	G091
Lead Staff:	Bellan, J.
Lead Agency:	HM
Remedial Action Taken:	NO
Substance:	Not reported
Date Reported:	Not reported
Facility Id:	RO0001632
Case Type:	Soil only
Case Closed:	Not reported
Date Closed:	**Not reported**

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273 **SACRAMENTO FOODS, INC.** **CA HIST UST** **U001615181**
East **424 NORTH 7TH STREET** **CA CHMIRS** **N/A**
1/4-1/2 **SACRAMENTO, CA, CA 95814** **CA ENVIROSTOR**
0.405 mi.
2137 ft.

Relative:
Higher

Actual:
27 ft.

HIST UST:

Region:	STATE
Facility ID:	00000057395
Facility Type:	Other
Other Type:	PROCESSING FACILITY
Contact Name:	JOE SIMAS
Telephone:	9164411241
Owner Name:	BOULEVARD PROPERTIES
Owner Address:	8401 JACKSON ROAD
Owner City,St,Zip:	SACRAMENTO, CA 95826
Total Tanks:	0011
Tank Num:	001
Container Num:	1
Year Installed:	1964
Tank Capacity:	00000500
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR

SACRAMENTO FOODS, INC. (Continued) **U001615181**

Container Construction Thickness: 12
Leak Detection: Stock Inventor

Tank Num: 002
Container Num: 2
Year Installed: 1975
Tank Capacity: 00012000
Tank Used for: PRODUCT
Type of Fuel: Not reported
Container Construction Thickness: Not reported
Leak Detection: Stock Inventor

Tank Num: 003
Container Num: 3
Year Installed: 1975
Tank Capacity: 00012000
Tank Used for: PRODUCT
Type of Fuel: Not reported
Container Construction Thickness: Not reported
Leak Detection: Stock Inventor

Tank Num: 004
Container Num: 4
Year Installed: 1975
Tank Capacity: 00012000
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Container Construction Thickness: Not reported
Leak Detection: Stock Inventor

Tank Num: 005
Container Num: 5
Year Installed: 1975
Tank Capacity: 00012000
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Container Construction Thickness: Not reported
Leak Detection: Stock Inventor

Tank Num: 006
Container Num: 6
Year Installed: 1975
Tank Capacity: 00012000
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Container Construction Thickness: Not reported
Leak Detection: Stock Inventor

Tank Num: 007
Container Num: 7
Year Installed: Not reported
Tank Capacity: 00006000
Tank Used for: PRODUCT
Type of Fuel: DIESEL
Container Construction Thickness: Not reported
Leak Detection: None

SACRAMENTO FOODS, INC. (Continued) **U001615181**

Tank Num:	008
Container Num:	8
Year Installed:	Not reported
Tank Capacity:	00006000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	009
Container Num:	9
Year Installed:	Not reported
Tank Capacity:	00006000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	010
Container Num:	10
Year Installed:	Not reported
Tank Capacity:	00006000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	011
Container Num:	11
Year Installed:	Not reported
Tank Capacity:	00002000
Tank Used for:	WASTE
Type of Fuel:	WASTE OIL
Container Construction Thickness:	Not reported
Leak Detection:	None

CHMIRS:

OES Incident Number:	02-6539
OES notification:	12/01/2002
OES Date:	Not reported
OES Time:	Not reported
Incident Date:	Not reported
Date Completed:	**Not reported**
Property Use:	Not reported
Agency Id Number:	Not reported
Agency Incident Number:	Not reported
Time Notified:	Not reported
Time Completed:	Not reported
Surrounding Area:	Not reported
Estimated Temperature:	Not reported
Property Management:	Not reported
More Than Two Substances Involved?:	Not reported
Resp Agncy Personel # Of Decontaminated:	Not reported
Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported

SACRAMENTO FOODS, INC. (Continued) **U001615181**

Others Number Of Fatalities:	Not reported
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA DOT PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	No
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	Unknown
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	2002
Agency:	Sacramento Fire
Incident Date:	12/1/200212:00:00 AM
Admin Agency:	Sacramento City Fire Department
Amount:	Not reported
Contained:	Yes
Site Type:	Merchant/Business
E Date:	Not reported
Substance:	Ammonia
Gallons:	0.000000
Unknown:	0
Substance #2:	Not reported
Substance #3:	Not reported
Evacuations:	0
Number of Injuries:	4
Number of Fatalities:	0
#1 Pipeline:	Not reported
#2 Pipeline:	Not reported
#3 Pipeline:	Not reported
#1 Vessel >= 300 Tons:	Not reported
#2 Vessel >= 300 Tons:	Not reported
#3 Vessel >= 300 Tons:	Not reported
Evacs:	Not reported
Injuries:	Not reported
Fatals:	Not reported
Comments:	Not reported
Description:	Substance was released from a cold storage plant. Substance was released from the refrigeration system. Fire Dept received complaints from passer by. 19 personnel, employees at a near by business had complaints . The 19 personnel at the near by businness sheltered in place. 4 personnel from a different location where transported to the hospital for observation. Co Hazmat has allowed plant to resume normal operations with plant personnel monitoring refrigeration system continuously. Substance has dispersed and there is no threat to the public at this time.

SACRAMENTO FOODS, INC. (Continued) **U001615181**

ENVIROSTOR:

Facility ID:	34200018
Status:	Refer: Other Agency
Status Date:	11/16/1994
Site Code:	Not reported
Site Type:	Historical
Site Type Detailed:	* Historical
Acres:	Not reported
NPL:	NO
Regulatory Agencies:	NONE SPECIFIED
Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	Referred - Not Assigned
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not reported
Latitude:	38.59854
Longitude:	-121.4902
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC:	* UNSPECIFIED AQUEOUS SOLUTION
Confirmed COC:	NONE SPECIFIED
Potential Description:	NONE SPECIFIED
Alias Name:	RICHARDS T. H. PROCESSING CO.
Alias Type:	Alternate Name
Alias Name:	34200018
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	* Discovery
Completed Date:	10/19/1979
Comments:	FACILITY IDENTIFIED TIP FROM BRAD PARSONS HAZARDOUS MATERIALS MANAGEMENT SECTION (HMMS).
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

AU274 **RELLES OIL** **CA LUST** **S103672856**
SSW **804 SOUTH RIVER ROAD** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.407 mi.
2148 ft. **Site 1 of 2 in cluster AU**

Relative:
Higher

Actual:
37 ft.

LUST REG 5:

Region:	5
Status:	Preliminary site assessment underway
Case Number:	570319
Case Type:	Other ground water affected
Substance:	GASOLINE
Staff Initials:	DFS
Lead Agency:	Regional
Program:	LUST
MTBE Code:	N/A

AU275 **RELLES OIL** **CA LUST** **S100278360**
SSW **804 SOUTH RIVER ROAD** **CA CHMIRS** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.407 mi.
2148 ft. **Site 2 of 2 in cluster AU**

Relative:
Higher

Actual:
37 ft.

LUST:

Region:	STATE
Global Id:	T0611355558
Latitude:	38.581015805
Longitude:	-121.511098345
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	08/01/2008
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	DFS
Local Agency:	YOLO COUNTY
RB Case Number:	570319
LOC Case Number:	Not reported
File Location:	Not reported
Potential Media Affect:	Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0611355558
Contact Type:	Local Agency Caseworker
Contact Name:	JOE WARD
Organization Name:	YOLO COUNTY
Address:	10 COTTONWOOD STREET
City:	WOODLAND
Email:	Not reported
Phone Number:	Not reported

Global Id:	T0611355558
Contact Type:	Regional Board Caseworker
Contact Name:	DAVID STAVAREK
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	dstavarek@waterboards.ca.gov

RELLES OIL (Continued) **S100278360**

Phone Number: Not reported

Status History:
Global Id: T0611355558
Status: Completed - Case Closed
Status Date: 08/01/2008

Global Id: T0611355558
Status: Open - Case Begin Date
Status Date: 03/30/2001

Global Id: T0611355558
Status: Open - Site Assessment
Status Date: 04/27/2004

Regulatory Activities:
Global Id: T0611355558
Action Type: RESPONSE
Date: 05/16/2003
Action: Preliminary Site Assessment Report

Global Id: T0611355558
Action Type: REMEDIATION
Date: 03/03/2001
Action: Not reported

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 07/23/2007
Action: Staff Letter

Global Id: T0611355558
Action Type: Other
Date: 03/30/2001
Action: Leak Discovery

Global Id: T0611355558
Action Type: REMEDIATION
Date: 12/06/2010
Action: Monitored Natural Attenuation

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 06/13/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 12/05/2007
Action: Verbal Communication

Global Id: T0611355558
Action Type: RESPONSE
Date: 01/30/2005
Action: Tank Removal Report / UST Sampling Report

RELLES OIL (Continued) **S100278360**

Global Id: T0611355558
Action Type: RESPONSE
Date: 06/10/2005
Action: Other Report / Document

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 12/03/2007
Action: Verbal Communication

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 03/11/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 05/14/2008
Action: Verbal Communication

Global Id: T0611355558
Action Type: Other
Date: 03/30/2001
Action: Leak Stopped

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 05/15/2008
Action: Notification - Public Participation Document

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 05/08/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 03/04/2003
Action: Staff Letter

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 03/30/2005
Action: Staff Letter

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 04/04/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 05/29/2008
Action: Verbal Communication

Global Id: T0611355558
Action Type: ENFORCEMENT

RELLES OIL (Continued) **S100278360**

Date: 03/24/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 05/16/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 08/01/2008
Action: Closure/No Further Action Letter

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 07/03/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 06/22/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611355558
Action Type: Other
Date: 10/09/2002
Action: Leak Reported

Global Id: T0611355558
Action Type: RESPONSE
Date: 07/24/2008
Action: Verbal Communication

Global Id: T0611355558
Action Type: RESPONSE
Date: 07/31/2008
Action: Other Report / Document

Global Id: T0611355558
Action Type: RESPONSE
Date: 10/05/2007
Action: Request for Closure

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 10/04/2007
Action: Verbal Communication

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 02/07/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 03/25/2008
Action: Verbal Communication

RELLES OIL (Continued) **S100278360**

Global Id: T0611355558
Action Type: ENFORCEMENT
Date: 02/26/2008
Action: Staff Letter

Global Id: T0611355558
Action Type: RESPONSE
Date: 06/30/2008
Action: Other Report / Document

CHMIRS:
OES Incident Number: 9119909
OES notification: Not reported
OES Date: Not reported
OES Time: Not reported
Incident Date: 18-OCT-91
Date Completed: 18-OCT-91
Property Use: 600
Agency Id Number: 57714
Agency Incident Number: 91233
Time Notified: 1511
Time Completed: 1900
Surrounding Area: 600
Estimated Temperature: 85
Property Management: P
More Than Two Substances Involved?: N
Resp Agncy Personel # Of Decontaminated: 0
Responding Agency Personel # Of Injuries: 0
Responding Agency Personel # Of Fatalities: 0
Others Number Of Decontaminated: 0
Others Number Of Injuries: 0
Others Number Of Fatalities: 0
Vehicle Make/year: Not reported
Vehicle License Number: Not reported
Vehicle State: Not reported
Vehicle Id Number: Not reported
CA DOT PUC/ICC Number: Not reported
Company Name: Not reported
Reporting Officer Name/ID: J. BRUCE SARAIN 426
Report Date: 18-OCT-91
Facility Telephone: 916 666-8646
Waterway Involved: Not reported
Waterway: Not reported
Spill Site: Not reported
Cleanup By: Not reported
Containment: Not reported
What Happened: Not reported
Type: Not reported
Measure: Not reported
Other: Not reported
Date/Time: Not reported
Year: 88-92
Agency: Not reported
Incident Date: Not reported
Admin Agency: Not reported
Amount: Not reported

RELLES OIL (Continued) **S100278360**

Contained:	Not reported
Site Type:	Not reported
E Date:	06-AUG-92
Substance:	Not reported
Unknown:	Not reported
Substance #2:	Not reported
Substance #3:	Not reported
Evacuations:	Not reported
Number of Injuries:	Not reported
Number of Fatalities:	Not reported
#1 Pipeline:	Not reported
#2 Pipeline:	Not reported
#3 Pipeline:	Not reported
#1 Vessel >= 300 Tons:	Not reported
#2 Vessel >= 300 Tons:	Not reported
#3 Vessel >= 300 Tons:	Not reported
Evacs:	Not reported
Injuries:	Not reported
Fatals:	Not reported
Comments:	N
Description:	Not reported

AS276 **GREYHOUND BUS TERMINAL** **CA HIST CORTESE** **S101300928**
SE **715 L ST** **CA LUST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814** **CA Sacramento Co. CS**
0.413 mi. **CA SWEEPS UST**
2181 ft. **Site 2 of 2 in cluster AS** **CA Sacramento Co. ML**

Relative: Higher

Actual: 23 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	LTNKA
Reg Id:	340370

LUST:

Region:	STATE
Global Id:	T0606700301
Latitude:	38.579106947
Longitude:	-121.4975779
Case Type:	LUST Cleanup Site
Status:	Open - Eligible for Closure
Status Date:	07/11/2013
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	SJE
Local Agency:	SACRAMENTO COUNTY LOP
RB Case Number:	340370
LOC Case Number:	0586/RO0000694
File Location:	Local Agency
Potential Media Affect:	Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	Diesel
Site History:	A number of soil and groundwater investigations have occurred at the Site since 1988. Five underground storage tanks (USTs) are reported to have been located at the Site. The reported USTs include three suspected USTs (Tanks A, E and D) and two 10,000-gallon diesel USTs. One of the 10,000-gallon USTs (Tank C) is reported to have been abandoned in-place, and the other 10,000-gallon UST (Tank B) was removed in 1991. Since 1989, twelve monitoring wells have been

GREYHOUND BUS TERMINAL (Continued) **S101300928**

installed at the Site. The monitoring wells include W-OHM, which was destroyed in 1991 during the removal of Tank B, and MW-1 through MW-11. An unknown thickness of free-phase diesel fuel was reported in well W-OHM during a December 1990 monitoring event. Groundwater monitoring at the Site has occurred since March 1996. Total petroleum hydrocarbons as diesel (TPHd) have been reported for groundwater samples from each site monitoring well except MW-10 and MW-11 at concentrations ranging from 50 to 160,000 micrograms per liter (8g/l). Total petroleum hydrocarbons as gasoline (TPHg) have also periodically been reported for groundwater samples collected from monitoring wells MW-1 through MW-9 at concentrations ranging from 50 to 950 8g/l. Benzene, toluene, ethylbenzene and total xylenes (BTEX) have been reported at concentrations ranging from 0.5 to 6.6 8g/l. Fuel oxygenate compounds (FOCs) have not been reported for any site groundwater sample with the exception of a single reported detection of 2.1 8g/l methyl tert-butyl ether (MTBE) for MW-5 in March 1996 and a single detection of 0.60 8g/l MTBE for MW-9 following its installation in October 2002. The March 1996 analysis for MW-5 was performed using the United States Environmental Protection Agency (EPA) Test Method 8020 and was not confirmed by subsequent EPA Test Method 8260 analysis. In response to a request for low risk closure, SCEMD indicated that the Site did not meet the requirements for low-risk closure, noting the presence of free-product in monitoring well W-OHM prior to its destruction in 1991. The SCEMD requested installation of either a remediation system or an additional groundwater monitoring well in the vicinity of the former location of W-OHM with annual groundwater monitoring to be performed until the current building is removed from the Site. Installation of well MW-9 in the vicinity of W-OHM occurred. TPHd was reported for MW-9 at 14,000 8g/l. Semi-annual sampling was directed. The SCEMD further directed that future groundwater monitoring events include well MW-3 from the Louie Brothers site located east of the Site on 8th Street (referred to as Louie MW-3). The second semi-annual groundwater sampling event of 2003 revealed that Louie MW-3 is paved over with concrete. SCEMD verbally requested that an evaluation of declining concentration trends be performed for each of the impacted groundwater monitoring wells at the Site. This evaluation was completed using the seasonal Kendall regression analysis software. The seasonal Kendall plots showed that each of the TPHd-impacted wells has an increasing slope with time, with the increases ranging from 17.13 8g/l per year (MW-2) to 111 8g/l per year (MW-8). The SCEMD also requested an evaluation of the relationship between groundwater elevation and TPHd concentration. This evaluation showed that the relationship between groundwater elevation and TPHd concentration in the impacted wells is not consistent between the individual wells for the data prior to 2000, but that from 2000 to date each well generally showed an increase in TPHd concentration relating to decreases in groundwater elevation. Based on the above trends, the consultants concluded that while the TPHd concentrations have remained relatively constant over time, the trends suggest that a continuing source of TPHd remains in the soils beneath the Site, most likely in the vicinity of the abandoned in-place and/or removed USTs. They further concluded that active remediation of these soils may be necessary to reverse the trends to show decreases in groundwater TPHd concentration with time. In March 2006, SCEMD determined that the site did not meet the Departments criteria for low risk closure because concentration trends are increasing. The

GREYHOUND BUS TERMINAL (Continued) **S101300928**

SCEMD further directed that the contaminated soil remaining in the vicinity of the abandoned in-place UST must be excavated during development of the Site and that if this does not occur prior to August 2008, another groundwater monitoring well is to be installed in the vicinity of the former Louie MW-3 well and quarterly groundwater monitoring must be resumed. The SCEMD in a letter dated April 17, 2006, directed the installation of the groundwater monitoring well east of the Site and resumption of quarterly groundwater monitoring. The SCEMD subsequently allowed deferment of the offsite well installation and continuance of semi-annual groundwater monitoring pending DBP Realty Partners, LPs assessment of the short-term use of the Site. The SCEMD, in a letter dated July 16, 2007, directed quarterly groundwater monitoring, the installation of two offsite monitoring wells to define the groundwater impacts beneath the Site and submittal of a feasibility study. On December 7, 2007,the consultants arranged for the installation of offsite groundwater monitoring wells MW-10 and MW-11. None of the tested analytes were reported above their respective method reporting limits (MRLs) for the groundwater samples collected from these wells. On February 6, 2009, the SCEMD approved annual monitoring for the Site. The site was again submitted for closure on September 17, 2010. Site still does not meet the closure criteria.

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606700301
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0606700301
Contact Type:	Local Agency Caseworker
Contact Name:	SUE ERIKSON
Organization Name:	SACRAMENTO COUNTY LOP
Address:	10590 Armstrong Avenue, Suite A
City:	Mather
Email:	eriksons@saccounty.net
Phone Number:	9168758433

Status History:

Global Id:	T0606700301
Status:	Open - Verification Monitoring
Status Date:	06/20/1996

Global Id:	T0606700301
Status:	Open - Case Begin Date
Status Date:	10/19/1988

Global Id:	T0606700301
Status:	Open - Eligible for Closure
Status Date:	07/11/2013

GREYHOUND BUS TERMINAL (Continued) **S101300928**

Global Id: T0606700301
Status: Open - Site Assessment
Status Date: 10/19/1988

Global Id: T0606700301
Status: Open - Site Assessment
Status Date: 08/01/1989

Global Id: T0606700301
Status: Open - Site Assessment
Status Date: 07/18/1991

Global Id: T0606700301
Status: Open - Site Assessment
Status Date: 12/19/1991

Regulatory Activities:

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 02/23/2010
Action: File Review - Closure

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 07/19/2011
Action: Staff Letter

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 02/21/2014
Action: Clean Up Fund - Case Closure Review Summary Report (RSR)

Global Id: T0606700301
Action Type: RESPONSE
Date: 12/20/2002
Action: Other Report / Document

Global Id: T0606700301
Action Type: RESPONSE
Date: 06/30/2003
Action: Monitoring Report - Quarterly

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 08/17/2000
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 01/01/1999
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 10/27/1999
Action: File review

GREYHOUND BUS TERMINAL (Continued) **S101300928**

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 01/08/2002
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 05/16/2002
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 01/14/2000
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 03/03/2003
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 09/30/2004
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 05/24/2010
Action: Clean Up Fund - Case Closure Review Summary Report (RSR)

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 09/17/2010
Action: File Review - Closure

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 05/23/2011
Action: File review

Global Id: T0606700301
Action Type: Other
Date: 02/27/1989
Action: Leak Discovery

Global Id: T0606700301
Action Type: RESPONSE
Date: 01/05/2010
Action: Clean Up Fund - 5-Year Review Summary

Global Id: T0606700301
Action Type: REMEDIATION
Date: 06/20/1996
Action: Monitored Natural Attenuation

Global Id: T0606700301
Action Type: ENFORCEMENT

GREYHOUND BUS TERMINAL (Continued) **S101300928**

Date: 01/28/2011
Action: Clean Up Fund - Case Closure Review Summary Report (RSR)

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 09/08/2011
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700301
Action Type: RESPONSE
Date: 09/01/2011
Action: Monitoring Report - Other

Global Id: T0606700301
Action Type: RESPONSE
Date: 05/19/2011
Action: Clean Up Fund - 5-Year Review Summary

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 06/27/2006
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 09/10/2010
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700301
Action Type: RESPONSE
Date: 02/17/2012
Action: Clean Up Fund - 5-Year Review Summary

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 01/17/2012
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 11/29/2011
Action: Meeting

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 02/22/2012
Action: Staff Letter

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 10/31/2011
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 06/13/2005
Action: File review

GREYHOUND BUS TERMINAL (Continued) **S101300928**

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 12/10/2012
Action: File review

Global Id: T0606700301
Action Type: Other
Date: 08/01/1989
Action: Leak Reported

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 03/25/2002
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 06/26/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 07/08/1999
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 06/01/2000
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 03/18/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 06/09/2003
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 10/04/2000
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 12/24/2003
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 01/05/2000
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT

GREYHOUND BUS TERMINAL (Continued) **S101300928**

Date: 12/13/2000
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 07/15/2002
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 02/05/2008
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 11/13/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 10/23/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 06/21/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 02/24/2006
Action: Meeting

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 12/26/2006
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 01/03/2006
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 12/06/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 12/30/2004
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 08/30/2006
Action: Technical Correspondence / Assistance / Other

GREYHOUND BUS TERMINAL (Continued) **S101300928**

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 08/30/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 02/13/1991
Action: Notice of Responsibility

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 04/10/2006
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 07/16/2008
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 01/08/2009
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 12/17/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 03/24/2009
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700301
Action Type: RESPONSE
Date: 05/21/2009
Action: Clean Up Fund - 5-Year Review Summary

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 02/21/2014
Action: Clean Up Fund - Letter to RP

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 02/13/1991
Action: Notification - Proposition 65

Global Id: T0606700301
Action Type: ENFORCEMENT
Date: 12/29/2009
Action: File review

Global Id: T0606700301
Action Type: ENFORCEMENT

GREYHOUND BUS TERMINAL (Continued) **S101300928**

Date: 06/15/2014
Action: State Water Board Closure Order

LUST REG 5:
Region: 5
Status: Post remedial action monitoring
Case Number: 340370
Case Type: Other ground water affected
Substance: DIESEL
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: 1

Sacramento Co. CS:
State Site Number: 0586
Lead Staff: Erikson, S.
Lead Agency: HM
Remedial Action Taken: YE, S
Substance: Diesel
Date Reported: 08/01/1989
Facility Id: RO0000694
Case Type: Other ground water affected
Case Closed: Not reported
Date Closed: Not reported

SWEEPS UST:
Status: Not reported
Comp Number: 14253
Number: Not reported
Board Of Equalization: Not reported
Referral Date: Not reported
Action Date: Not reported
Created Date: Not reported
Owner Tank Id: Not reported
SWRCB Tank Id: 34-000-014253-000001
Tank Status: Not reported
Capacity: 10000
Active Date: Not reported
Tank Use: M.V. FUEL
STG: PRODUCT
Content: DIESEL
Number Of Tanks: 1

Sacramento Co. ML:
Facility Id: U0020286
Facility Status: Inactive. Included on a listing no longer updated.
FD: U
Billing Codes BP: Disclaimer
Billing Codes UST: No Tanks
WG Bill Code: Oil Changed by Outside Company-No Fee
Target Property Bill Cod: 50
Food Bill Code: 50
CUPA Permit Date: Not reported

GREYHOUND BUS TERMINAL (Continued) **S101300928**

HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	4131
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AV277 **820 WEST CAPITOL AVENUE** **US BROWNFIELDS** **1016346036**
WSW **820 WEST CAPITOL AVENUE** **FINDS** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.456 mi.
2409 ft. **Site 1 of 5 in cluster AV**

Relative:
Higher

Actual:
30 ft.

US BROWNFIELDS:

Recipient name:	West Sacramento
Grant type:	Assessment
Property name:	820 WEST CAPITOL AVENUE
Property #:	Not reported
Parcel size:	Not reported
Property Description:	Undeveloped land associated with adjacent motel
Latitude:	38.5826
Longitude:	-121.5181
HCM label:	Address Matching-House Number
Map scale:	1:24,000
Point of reference:	Entrance Point of a Facility or Station
Datum:	Not reported
ACRES property ID:	18983
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	135.44
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	Not reported
Cleanup funding entity:	Not reported
Grant type:	N/A
Accomplishment type:	Phase I Environmental Assessment
Accomplishment count:	1
Cooperative agreement #:	97975501
Ownership entity:	Not reported
Current owner:	Ambu Inc.
Did owner change:	Not reported
Cleanup required:	Not reported
Video available:	Not reported
Photo available:	Not reported
Institutional controls required:	Not reported
IC Category proprietary controls:	Not reported

820 WEST CAPITOL AVENUE (Continued) **1016346036**

IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	Unknown
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Not reported
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Not reported
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Not reported
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	Not reported
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported
Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported

820 WEST CAPITOL AVENUE (Continued) **1016346036**

mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported
Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported

FINDS:

Registry ID: 110038702838

Environmental Interest/Information System
US EPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) is an federal online database for Brownfields Grantees to electronically submit data directly to EPA.

AV278 **FORMER EXPERIENCE MOTEL** **CA LUST** **S109285403**
WSW **820-824 WEST CAPITOL AVENUE** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.456 mi.
2409 ft. **Site 2 of 5 in cluster AV**

Relative:
Higher

Actual:
30 ft.

LUST:

Region:	STATE
Global Id:	T10000000425
Latitude:	38.58351
Longitude:	-121.5178
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	01/13/2011
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	DFS
Local Agency:	Not reported
RB Case Number:	570345
LOC Case Number:	Not reported
File Location:	Not reported

FORMER EXPERIENCE MOTEL (Continued) **S109285403**

Potential Media Affect: Not reported
Potential Contaminants of Concern: Not reported
Site History: The case was opened following an unauthorized release from an underground storage tank system at the subject site. Corrective action is underway as directed by the CVRWQCB. Corrective action may consist of preliminary site investigation, planning and implementation of remedial action, verification monitoring, or a combination thereof. A summary of the site history is available by clicking on either the "Cleanup Status History", "Regulatory Activities" or the "Site Maps/Documents" tab. For a complete site history the case file at the CVRWQCB should be consulted.

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T10000000425
Contact Type: Regional Board Caseworker
Contact Name: DAVID STAVAREK
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: dstavarek@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T10000000425
Status: Open - Site Assessment
Status Date: 09/12/2008

Global Id: T10000000425
Status: Completed - Case Closed
Status Date: 01/13/2011

Global Id: T10000000425
Status: Open - Case Begin Date
Status Date: 09/12/2008

Regulatory Activities:
Global Id: T10000000425
Action Type: ENFORCEMENT
Date: 01/13/2011
Action: Closure/No Further Action Letter

Global Id: T10000000425
Action Type: ENFORCEMENT
Date: 09/20/2010
Action: Staff Letter

Global Id: T10000000425
Action Type: RESPONSE
Date: 09/17/2010
Action: Tank Removal Report / UST Sampling Report

Global Id: T10000000425
Action Type: RESPONSE
Date: 12/03/2010
Action: Request for Closure

FORMER EXPERIENCE MOTEL (Continued) **S109285403**

Global Id: T10000000425
Action Type: REMEDIATION
Date: 04/30/1980
Action: Other (Use Description Field)

Global Id: T10000000425
Action Type: ENFORCEMENT
Date: 11/08/2010
Action: Notification - Public Notice of Case Closure

Global Id: T10000000425
Action Type: Other
Date: 09/12/2008
Action: Leak Discovery

Global Id: T10000000425
Action Type: ENFORCEMENT
Date: 10/22/2008
Action: Staff Letter

Global Id: T10000000425
Action Type: ENFORCEMENT
Date: 10/14/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T10000000425
Action Type: ENFORCEMENT
Date: 10/22/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T10000000425
Action Type: ENFORCEMENT
Date: 10/16/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T10000000425
Action Type: RESPONSE
Date: 02/08/2009
Action: Soil and Water Investigation Workplan

Global Id: T10000000425
Action Type: RESPONSE
Date: 10/28/2009
Action: Verbal Communication

Global Id: T10000000425
Action Type: RESPONSE
Date: 06/15/2009
Action: Other Workplan

Global Id: T10000000425
Action Type: ENFORCEMENT
Date: 02/17/2009
Action: Staff Letter

Global Id: T10000000425
Action Type: ENFORCEMENT

FORMER EXPERIENCE MOTEL (Continued) **S109285403**

Date: 06/10/2009
Action: Staff Letter

Global Id: T10000000425
Action Type: ENFORCEMENT
Date: 07/09/2009
Action: Staff Letter

Global Id: T10000000425
Action Type: ENFORCEMENT
Date: 08/25/2009
Action: Staff Letter

Global Id: T10000000425
Action Type: RESPONSE
Date: 10/27/2008
Action: Verbal Communication

Global Id: T10000000425
Action Type: RESPONSE
Date: 11/16/2009
Action: Verbal Communication

Global Id: T10000000425
Action Type: RESPONSE
Date: 10/23/2008
Action: Correspondence

Global Id: T10000000425
Action Type: RESPONSE
Date: 05/20/2009
Action: Correspondence

Global Id: T10000000425
Action Type: RESPONSE
Date: 10/28/2008
Action: Verbal Communication

Global Id: T10000000425
Action Type: RESPONSE
Date: 07/08/2009
Action: Verbal Communication

Global Id: T10000000425
Action Type: RESPONSE
Date: 12/02/2009
Action: Correspondence

Global Id: T10000000425
Action Type: RESPONSE
Date: 11/30/2009
Action: Other Workplan

Global Id: T10000000425
Action Type: RESPONSE
Date: 03/25/2010
Action: Correspondence

FORMER EXPERIENCE MOTEL (Continued) **S109285403**

Global Id: T10000000425
Action Type: RESPONSE
Date: 07/16/2009
Action: Correspondence

Global Id: T10000000425
Action Type: RESPONSE
Date: 09/22/2009
Action: Verbal Communication

Global Id: T10000000425
Action Type: RESPONSE
Date: 10/13/2009
Action: Correspondence

Global Id: T10000000425
Action Type: RESPONSE
Date: 12/17/2009
Action: Verbal Communication

Global Id: T10000000425
Action Type: RESPONSE
Date: 03/15/2009
Action: Other Report / Document

Global Id: T10000000425
Action Type: RESPONSE
Date: 03/11/2009
Action: Correspondence

Global Id: T10000000425
Action Type: RESPONSE
Date: 04/13/2009
Action: Correspondence

Global Id: T10000000425
Action Type: RESPONSE
Date: 06/03/2010
Action: Correspondence

279
SSE
1/4-1/2
0.459 mi.
2423 ft.

TUNE UP MASTERS **CA HIST CORTESE** **S102426316**
1400 5TH ST **CA LUST** **N/A**
SACRAMENTO, CA 95814 **CA Sacramento Co. CS**
CA Sacramento Co. ML

Relative:
Higher

Actual:
28 ft.

HIST CORTESE:
Region: CORTESE
Facility County Code: 34
Reg By: LTNKA
Reg Id: 340340

LUST:
Region: STATE
Global Id: T0606700272
Latitude: 38.5776287

TUNE UP MASTERS (Continued) **S102426316**

Longitude:	-121.5020726
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	07/31/1996
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	SBW
Local Agency:	SACRAMENTO COUNTY LOP
RB Case Number:	340340
LOC Case Number:	0461
File Location:	Not reported
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606700272
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0606700272
Contact Type:	Local Agency Caseworker
Contact Name:	SUSAN BETTS WILLIAMS
Organization Name:	SACRAMENTO COUNTY LOP
Address:	8475 JACKSON ROAD, SUITE 230
City:	SACRAMENTO
Email:	williamssb@saccounty.net
Phone Number:	Not reported

Status History:

Global Id:	T0606700272
Status:	Open - Case Begin Date
Status Date:	03/24/1989

Global Id:	T0606700272
Status:	Open - Remediation
Status Date:	05/07/1990

Global Id:	T0606700272
Status:	Open - Remediation
Status Date:	06/28/1991

Global Id:	T0606700272
Status:	Open - Site Assessment
Status Date:	03/31/1989

Global Id:	T0606700272
Status:	Open - Site Assessment
Status Date:	01/05/1990

Global Id:	T0606700272

TUNE UP MASTERS (Continued) **S102426316**

Status: Open - Site Assessment
Status Date: 05/07/1990

Global Id: T0606700272
Status: Completed - Case Closed
Status Date: 07/31/1996

Regulatory Activities:
Global Id: T0606700272
Action Type: Other
Date: 03/24/1989
Action: Leak Discovery

Global Id: T0606700272
Action Type: Other
Date: 03/31/1989
Action: Leak Reported

Global Id: T0606700272
Action Type: ENFORCEMENT
Date: 01/05/1990
Action: * Historical Enforcement

Global Id: T0606700272
Action Type: ENFORCEMENT
Date: 01/05/1990
Action: * No Action

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 340340
Case Type: Drinking Water Aquifer affected
Substance: GASOLINE
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

Sacramento Co. CS:
State Site Number: 0461
Lead Staff: Williams, S.
Lead Agency: HM
Remedial Action Taken: YE, S
Substance: Automotive(motor gasoline and additives)
Date Reported: 03/31/1989
Facility Id: RO0000101
Case Type: Other ground water affected
Case Closed: Y
Date Closed: 04/22/1996

Sacramento Co. ML:
Facility Id: Not reported
Facility Status: Inactive. Included on a listing no longer updated.

TUNE UP MASTERS (Continued) **S102426316**

FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	02/24/1998
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	02/24/1998
SIC Code:	7532
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

Facility Id:	Not reported
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AV280 **THE EXPERIENCE MOTEL** **US BROWNFIELDS** **1016349802**
WSW **824 WEST CAPITOL AVENUE** **FINDS** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.459 mi.
2423 ft. **Site 3 of 5 in cluster AV**

Relative:
Higher

Actual:
30 ft.

US BROWNFIELDS:

Recipient name:	West Sacramento
Grant type:	Assessment
Property name:	THE EXPERIENCE MOTEL
Property #:	008-150-066-000
Parcel size:	1.11
Property Description:	Motel since at least 1954
Latitude:	38.58261
Longitude:	-121.51867
HCM label:	Address Matching-House Number

THE EXPERIENCE MOTEL (Continued) **1016349802**

Map scale:	1:24,000
Point of reference:	Entrance Point of a Facility or Station
Datum:	North American Datum of 1983
ACRES property ID:	18984
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	135.44
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	Not reported
Cleanup funding entity:	Not reported
Grant type:	P
Accomplishment type:	Phase I Environmental Assessment
Accomplishment count:	1
Cooperative agreement #:	97975501
Ownership entity:	Government
Current owner:	City of West Sacramento
Did owner change:	N
Cleanup required:	Yes
Video available:	No
Photo available:	Yes
Institutional controls required:	N
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	No
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	13-JAN-11
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Y
Groundwater cleaned:	Y
Lead contaminant found:	Not reported
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported

THE EXPERIENCE MOTEL (Continued) **1016349802**

PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Y
Petro products cleaned:	Y
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Y
Soil cleaned up:	Y
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	1.11
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	N
Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported
Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported

Recipient name: West Sacramento, City of

THE EXPERIENCE MOTEL (Continued) **1016349802**

Grant type:	Cleanup
Property name:	THE EXPERIENCE MOTEL
Property #:	008-150-066-000
Parcel size:	1.11
Property Description:	Motel since at least 1954
Latitude:	38.58261
Longitude:	-121.51867
HCM label:	Address Matching-House Number
Map scale:	1:24,000
Point of reference:	Entrance Point of a Facility or Station
Datum:	North American Datum of 1983
ACRES property ID:	18984
Start date:	05-MAY-10
Completed date:	05-NOV-10
Acres cleaned up:	1.1
Cleanup funding:	87907
Cleanup funding source:	US EPA - Brownfields Cleanup Cooperative Agreement
Assessment funding:	Not reported
Assessment funding source:	Not reported
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	Not reported
Cleanup funding entity:	EPA
Grant type:	P
Accomplishment type:	Not reported
Accomplishment count:	0
Cooperative agreement #:	00T17601
Ownership entity:	Government
Current owner:	City of West Sacramento
Did owner change:	N
Cleanup required:	Yes
Video available:	No
Photo available:	Yes
Institutional controls required:	N
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	No
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	13-JAN-11
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Y
Groundwater cleaned:	Y
Lead contaminant found:	Not reported
Lead cleaned up:	Not reported

THE EXPERIENCE MOTEL (Continued) **1016349802**

No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Y
Petro products cleaned:	Y
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Y
Soil cleaned up:	Y
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	1.11
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	N
Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported
Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported

THE EXPERIENCE MOTEL (Continued) **1016349802**

Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported

FINDS:

Registry ID: 110038765271

Environmental Interest/Information System
US EPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) is an federal online database for Brownfields Grantees to electronically submit data directly to EPA.

AV281 **OLD TOWN INN** **US BROWNFIELDS** **1016346037**
WSW **826 WEST CAPITOL AVENUE** **FINDS** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.460 mi.
2430 ft. **Site 4 of 5 in cluster AV**

Relative:
Higher

Actual:
27 ft.

US BROWNFIELDS:

Recipient name:	West Sacramento
Grant type:	Assessment
Property name:	OLD TOWN INN
Property #:	Not reported
Parcel size:	Not reported
Property Description:	Motel since at least 1954
Latitude:	38.58261
Longitude:	-121.51867
HCM label:	Address Matching-House Number
Map scale:	1:24,000
Point of reference:	Entrance Point of a Facility or Station
Datum:	Not reported
ACRES property ID:	18985
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	135.44
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	Not reported
Cleanup funding entity:	Not reported
Grant type:	N/A
Accomplishment type:	Phase I Environmental Assessment
Accomplishment count:	1
Cooperative agreement #:	97975501
Ownership entity:	Not reported
Current owner:	Manhar Patel
Did owner change:	Not reported

OLD TOWN INN (Continued) **1016346037**

Cleanup required:	Not reported
Video available:	Not reported
Photo available:	Not reported
Institutional controls required:	Not reported
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	Unknown
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Not reported
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Not reported
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Not reported
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	Not reported
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported

OLD TOWN INN (Continued) **1016346037**

Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported
Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported

FINDS:

Registry ID: 110038702847

Environmental Interest/Information System
US EPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) is an federal online database for Brownfields Grantees to electronically submit data directly to EPA.

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282 **SACRAMENTO CITY HALL** **CA HIST CORTESE** **S102820544**
SE **915 I ST** **CA LUST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814** **CA Sacramento Co. CS**
0.466 mi. **CA Sacramento Co. ML**
2463 ft.

Relative: Higher

Actual: 27 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	LTNKA
Reg Id:	340674

LUST:

Region:	STATE
Global Id:	T0606700575

SACRAMENTO CITY HALL (Continued) **S102820544**

Latitude:	38.582124
Longitude:	-121.493425
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	01/31/1997
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	Not reported
Local Agency:	Not reported
RB Case Number:	340674
LOC Case Number:	C502
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606700575
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Status History:

Global Id:	T0606700575
Status:	Completed - Case Closed
Status Date:	01/31/1997
Global Id:	T0606700575
Status:	Open - Case Begin Date
Status Date:	10/20/1992
Global Id:	T0606700575
Status:	Open - Remediation
Status Date:	01/03/1993
Global Id:	T0606700575
Status:	Open - Site Assessment
Status Date:	10/20/1992

Regulatory Activities:

Global Id:	T0606700575
Action Type:	Other
Date:	10/20/1992
Action:	Leak Discovery
Global Id:	T0606700575
Action Type:	Other
Date:	10/27/1992
Action:	Leak Reported

SACRAMENTO CITY HALL (Continued) **S102820544**

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 340674
Case Type: Soil only
Substance: GASOLINE
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

Sacramento Co. CS:
State Site Number: C502
Lead Staff: Benedict, A.
Lead Agency: HM
Remedial Action Taken: NO
Substance: Automotive(motor gasoline and additives)
Date Reported: 10/20/1992
Facility Id: RO0000638
Case Type: Other ground water affected
Case Closed: Y
Date Closed: 01/24/1997

Sacramento Co. ML:
Facility Id: 00094049
Facility Status: Inactive. Included on a listing no longer updated.
FD: U
Billing Codes BP: Disclaimer
Billing Codes UST: No Tanks
WG Bill Code: Oil Changed by Outside Company-No Fee
Target Property Bill Cod: 50
Food Bill Code: 50
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: Not reported
UST Permit Dt: Not reported
UST Inspection Date: Not reported
UST Tank Test Date: Not reported
Number of Tanks: 0
UST Tank Test Date: Not reported
SIC Code: Not reported
Tier Permitting: Not reported
AST Bill Code: Not reported
CALARP Bill Code: Not reported

AW283 **LOUIE BROTHERS GARAGE** **CA LUST** **S101300929**
SE **805-809 L ST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814**
0.467 mi.
2465 ft. **Site 1 of 2 in cluster AW**

Relative:
Higher

Actual:
22 ft.

LUST:
Region: STATE
Global Id: T0606700533
Latitude: 38.578747

LOUIE BROTHERS GARAGE (Continued) **S101300929**

Longitude:	-121.4967433
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	04/25/2003
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	Not reported
Local Agency:	Not reported
RB Case Number:	340628
LOC Case Number:	A596
File Location:	Local Agency
Potential Media Affect:	Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606700533
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Status History:

Global Id:	T0606700533
Status:	Completed - Case Closed
Status Date:	04/25/2003
Global Id:	T0606700533
Status:	Open - Case Begin Date
Status Date:	09/19/1986
Global Id:	T0606700533
Status:	Open - Remediation
Status Date:	05/24/1993
Global Id:	T0606700533
Status:	Open - Site Assessment
Status Date:	06/20/1991
Global Id:	T0606700533
Status:	Open - Site Assessment
Status Date:	01/23/1992
Global Id:	T0606700533
Status:	Open - Site Assessment
Status Date:	01/29/1992

Regulatory Activities:

Global Id:	T0606700533
Action Type:	ENFORCEMENT
Date:	04/18/2003
Action:	Site Visit / Inspection / Sampling

LOUIE BROTHERS GARAGE (Continued) **S101300929**

Global Id: T0606700533
Action Type: ENFORCEMENT
Date: 04/25/2003
Action: File review

Global Id: T0606700533
Action Type: Other
Date: 01/29/1992
Action: Leak Discovery

Global Id: T0606700533
Action Type: REMEDIATION
Date: 09/09/1992
Action: Monitored Natural Attenuation

Global Id: T0606700533
Action Type: Other
Date: 09/19/1986
Action: Leak Stopped

Global Id: T0606700533
Action Type: ENFORCEMENT
Date: 05/22/2002
Action: File review

Global Id: T0606700533
Action Type: Other
Date: 03/27/1992
Action: Leak Reported

Global Id: T0606700533
Action Type: ENFORCEMENT
Date: 03/27/1992
Action: Notice of Reimbursement

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 340628
Case Type: Other ground water affected
Substance: GASOLINE
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: 0

AW284 **JAMES LOUIE** **CA Sacramento Co. CS** **S104586376**
SE **805 L ST** **CA Sacramento Co. ML** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814**
0.468 mi.
2470 ft. **Site 2 of 2 in cluster AW**

Relative:
Higher

Actual:
22 ft.

Sacramento Co. CS:
State Site Number: A596
Lead Staff: Marcus, B.
Lead Agency: HM

JAMES LOUIE (Continued) **S104586376**

Remedial Action Taken:	NO
Substance:	Automotive(motor gasoline and additives)
Date Reported:	03/27/1992
Facility Id:	RO0000695
Case Type:	Other ground water affected
Case Closed:	Y
Date Closed:	**04/25/2003**

Sacramento Co. ML:

Facility Id:	U01730
Facility Status:	Inactive. Included on a listing no longer updated.
FD:	U
Billing Codes BP:	Out of Business
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	51
Food Bill Code:	51
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AX285 **WHALEY PROPERTY** **US BROWNFIELDS** **1016349996**
SSW **804 SOUTH RIVER ROAD** **FINDS** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.470 mi.
2482 ft. **Site 1 of 4 in cluster AX**

Relative:
Higher

Actual:
34 ft.

US BROWNFIELDS:

Recipient name:	West Sacramento, City of
Grant type:	Assessment
Property name:	WHALEY PROPERTY
Property #:	058-320-091
Parcel size:	3.29
Property Description:	The property was vacant until a wharehouse was contructed at the site in the 1950s. The property was purchased by the current owner for the operation of gas station. This operation ceased in the late 1990s or early 2000s, and four underground storage tanks were removed from the site. The California Regional Water Quality Control Board required the owner to conduct groundwater testing following the removal of the tanks, and in 2008 a no further action letter was issued by the State for this site.
Latitude:	Not reported
Longitude:	Not reported
HCM label:	Not reported
Map scale:	Not reported
Point of reference:	Not reported
Datum:	World Geodetic System of 1984

WHALEY PROPERTY (Continued) **1016349996**

ACRES property ID:	97229
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	4434
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	EPA
Cleanup funding entity:	Not reported
Grant type:	N/A
Accomplishment type:	Phase I Environmental Assessment
Accomplishment count:	1
Cooperative agreement #:	96950001
Ownership entity:	Private
Current owner:	Porta Bella Properties Inc
Did owner change:	N
Cleanup required:	No
Video available:	No
Photo available:	Yes
Institutional controls required:	U
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	Not reported
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Not reported
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported

WHALEY PROPERTY (Continued) **1016349996**

Petro products found:	Not reported
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Not reported
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	Not reported
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported
Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported
Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported

FINDS:

Registry ID: 110039058159

WHALEY PROPERTY (Continued) **1016349996**

Environmental Interest/Information System
US EPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) is an federal online database for Brownfields Grantees to electronically submit data directly to EPA.

AX286 **COAST OIL COMPANY** UP TO 1997 ARCHIVED** **CA SLIC** **S106230593**
SSW **801 RIVER RD S** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA**
0.472 mi.
2493 ft. **Site 2 of 4 in cluster AX**

Relative:
Higher

Actual:
34 ft.

SLIC REG 5:

Region:	5
Facility Status:	Closed by County
Unit:	Facility is a Spill or site
Pollutant:	TPH, benzene
Lead Agency:	Not reported
Date Filed:	02/25/97
Report Date:	02/07/97
Date Added:	Not reported
Date Closed:	Not reported

AX287 **WESTCO TECHNOLOGIES** **CA ENVIROSTOR** **S101482934**
SSW **801 SOUTH RIVER RD.** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.472 mi.
2493 ft. **Site 3 of 4 in cluster AX**

Relative:
Higher

Actual:
34 ft.

ENVIROSTOR:

Facility ID:	57290002
Status:	Refer: RWQCB
Status Date:	01/29/1987
Site Code:	Not reported
Site Type:	Evaluation
Site Type Detailed:	Evaluation
Acres:	Not reported
NPL:	NO
Regulatory Agencies:	NONE SPECIFIED
Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	Steven Becker
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not reported
Latitude:	38.58083
Longitude:	-121.5102
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC:	* UNSPECIFIED OIL CONTAINING WASTE
Confirmed COC:	NONE SPECIFIED
Potential Description:	NONE SPECIFIED

WESTCO TECHNOLOGIES (Continued) **S101482934**

Alias Name: 57290002
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 11/15/2000
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 01/29/1987
Comments: NO DEPARTMENT OF HEALTH SERVICES FILE FOUND.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 03/26/1982
Comments: ACTIVE SITE SPILLED PETROLEUM ON GROUND. SITE REFERRED TO COUNTY HEALTH AND REGIONAL WATER QUALITY CONTROL BOARD.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

AX288 **RIVER WALK PROPERTY** **US BROWNFIELDS 1016347554**
SSW **SOUTH RIVER ROAD & THIRD STREET** **FINDS N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.473 mi.
2496 ft. **Site 4 of 4 in cluster AX**

Relative:
Higher

Actual:
34 ft.

US BROWNFIELDS:
Recipient name: West Sacramento, City of
Grant type: Assessment
Property name: RIVER WALK PROPERTY
Property #: 058-320-39, 058-320-37, 058-320-40
Parcel size: 8
Property Description: Historical research dating back to 1907 indicates that the property was used primarily as a petroleum bulk storage facility by Coast Oil and later by Texas Oil Company and Texaco Oil Company. Other owners/users include a locomotive maintenance facility by Union Pacific Railroad. (PPF - River Walk Property, 7/26/07)
Latitude: 38.58117
Longitude: -121.51124
HCM label: Address Matching-Nearest Intersection
Map scale: Not reported
Point of reference: Other Point
Datum: World Geodetic System of 1984
ACRES property ID: 54261
Start date: Not reported

RIVER WALK PROPERTY (Continued) **1016347554**

Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	8807
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	Not reported
Cleanup funding entity:	Not reported
Grant type:	N/A
Accomplishment type:	Phase I Environmental Assessment
Accomplishment count:	1
Cooperative agreement #:	96950001
Ownership entity:	Government
Current owner:	City of West Sacramento
Did owner change:	N
Cleanup required:	Unknown
Video available:	No
Photo available:	Yes
Institutional controls required:	Not reported
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	Unknown
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Not reported
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Y
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Y
Petro products cleaned:	Not reported

RIVER WALK PROPERTY (Continued) **1016347554**

Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Not reported
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	Not reported
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported
Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported
Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported

FINDS:

Registry ID: 110038724039

Environmental Interest/Information System
US EPA Assessment, Cleanup and Redevelopment Exchange System (ACRES)

RIVER WALK PROPERTY (Continued) **1016347554**

is an federal online database for Brownfields Grantees to electronically submit data directly to EPA.

AV289 **CAPITOL TRAVEL INN** **US BROWNFIELDS** **1016346035**
WSW **817 WEST CAPITOL AVENUE** **FINDS** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.477 mi.
2521 ft. **Site 5 of 5 in cluster AV**

Relative:
Higher

Actual:
31 ft.

US BROWNFIELDS:

Recipient name:	West Sacramento
Grant type:	Assessment
Property name:	CAPITOL TRAVEL INN
Property #:	Not reported
Parcel size:	Not reported
Property Description:	Motel since at least 1954
Latitude:	38.58262
Longitude:	-121.51924
HCM label:	Address Matching-House Number
Map scale:	1:24,000
Point of reference:	Entrance Point of a Facility or Station
Datum:	Not reported
ACRES property ID:	18982
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	135.44
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	Not reported
Cleanup funding entity:	Not reported
Grant type:	N/A
Accomplishment type:	Phase I Environmental Assessment
Accomplishment count:	1
Cooperative agreement #:	97975501
Ownership entity:	Not reported
Current owner:	Shirish Patel
Did owner change:	Not reported
Cleanup required:	Not reported
Video available:	Not reported
Photo available:	Not reported
Institutional controls required:	Not reported
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	Unknown
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported

CAPITOL TRAVEL INN (Continued) **1016346035**

Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Not reported
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Not reported
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Not reported
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	Not reported
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported
Arsenic cleaned up:	Not reported
Cadmium cleaned up:	Not reported
Chromium cleaned up:	Not reported
Copper cleaned up:	Not reported
Iron cleaned up:	Not reported
mercury cleaned up:	Not reported
nickel cleaned up:	Not reported
No clean up:	Not reported
Pesticides cleaned up:	Not reported
Selenium cleaned up:	Not reported
SVOCs cleaned up:	Not reported
Unknown clean up:	Not reported
Arsenic contaminant found:	Not reported
Cadmium contaminant found:	Not reported

CAPITOL TRAVEL INN (Continued) **1016346035**

Chromium contaminant found:	Not reported
Copper contaminant found:	Not reported
Iron contaminant found:	Not reported
Mercury contaminant found:	Not reported
Nickel contaminant found:	Not reported
No contaminant found:	Not reported
Pesticides contaminant found:	Not reported
Selenium contaminant found:	Not reported
SVOCs contaminant found:	Not reported
Unknown contaminant found:	Not reported
Future Use: Multistory	Not reported
Media affected Bluiding Material:	Not reported
Media affected indoor air:	Not reported
Building material media cleaned up:	Not reported
Indoor air media cleaned up:	Not reported
Unknown media cleaned up:	Not reported
Past Use: Multistory	Not reported

FINDS:

Registry ID: 110038702829

Environmental Interest/Information System
US EPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) is an federal online database for Brownfields Grantees to electronically submit data directly to EPA.

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290 NE 1/4-1/2 0.481 mi. 2538 ft.

CALVADA SALES COMPANY
444 RICHARDS BLVD
SACRAMENTO, CA 95814

CA LUST S101590615
CA FID UST N/A
CA Sacramento Co. CS
CA SWEEPS UST
CA Sacramento Co. ML

Relative: Higher

Actual: 23 ft.

LUST:

Region:	STATE
Global Id:	T0606701010
Latitude:	38.596452
Longitude:	-121.496161
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	12/19/2007
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	DVA
Local Agency:	SACRAMENTO COUNTY LOP
RB Case Number:	341185
LOC Case Number:	E577
File Location:	Local Agency
Potential Media Affect:	Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	Other Solvent or Non-Petroleum Hydrocarbon
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606701010
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER

CALVADA SALES COMPANY (Continued) **S101590615**

Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: vera.fischer@waterboards.ca.gov
Phone Number: Not reported

Global Id: T0606701010
Contact Type: Local Agency Caseworker
Contact Name: DAVID VON ASPERN
Organization Name: SACRAMENTO COUNTY LOP
Address: 10590 ARMSTRONG AVENUE, SUITE A
City: MATHER
Email: vonaspernd@saccounty.net
Phone Number: Not reported

Status History:
Global Id: T0606701010
Status: Completed - Case Closed
Status Date: 12/19/2007

Global Id: T0606701010
Status: Open - Verification Monitoring
Status Date: 09/27/2006

Global Id: T0606701010
Status: Open - Case Begin Date
Status Date: 01/13/1998

Global Id: T0606701010
Status: Open - Site Assessment
Status Date: 07/12/2001

Regulatory Activities:
Global Id: T0606701010
Action Type: ENFORCEMENT
Date: 05/17/2004
Action: File review

Global Id: T0606701010
Action Type: Other
Date: 01/13/1998
Action: Leak Discovery

Global Id: T0606701010
Action Type: REMEDIATION
Date: 07/30/2004
Action: Monitored Natural Attenuation

Global Id: T0606701010
Action Type: ENFORCEMENT
Date: 12/19/2007
Action: Closure/No Further Action Letter

Global Id: T0606701010
Action Type: Other
Date: 07/30/2004

CALVADA SALES COMPANY (Continued) **S101590615**

Action: Leak Stopped

Global Id: T0606701010
Action Type: Other
Date: 05/11/1998
Action: Leak Reported

Global Id: T0606701010
Action Type: ENFORCEMENT
Date: 10/29/2004
Action: File review

Global Id: T0606701010
Action Type: ENFORCEMENT
Date: 03/05/1998
Action: Notification - Proposition 65

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 341185
Case Type: Other ground water affected
Substance: HYDROCARBONS
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

CA FID UST:
Facility ID: 34002937
Regulated By: UTNKA
Regulated ID: Not reported
Cortese Code: Not reported
SIC Code: Not reported
Facility Phone: 9164416290
Mail To: Not reported
Mailing Address: 444 RICHARDS BLVD
Mailing Address 2: Not reported
Mailing City,St,Zip: SACRAMENTO 95814
Contact: Not reported
Contact Phone: Not reported
DUNs Number: Not reported
NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Active

Sacramento Co. CS:
State Site Number: C230
Lead Staff: Von Aspern, D.
Lead Agency: HM
Remedial Action Taken: NO
Substance: Automotive(motor gasoline and additives)
Date Reported: 01/09/1998
Facility Id: RO0001005

CALVADA SALES COMPANY (Continued) **S101590615**

Case Type: Undefined
Case Closed: Not reported
Date Closed: Not reported

SWEEPS UST:
Status: Active
Comp Number: 26
Number: 2
Board Of Equalization: 44-018592
Referral Date: 08-19-92
Action Date: 01-06-93
Created Date: 10-14-88
Owner Tank Id: 2
SWRCB Tank Id: 34-000-000026-000002
Tank Status: A
Capacity: 5000
Active Date: 10-14-88
Tank Use: M.V. FUEL
STG: P
Content: DIESEL
Number Of Tanks: 1

Status: Not reported
Comp Number: 26
Number: Not reported
Board Of Equalization: 44-018592
Referral Date: Not reported
Action Date: Not reported
Created Date: Not reported
Owner Tank Id: Not reported
SWRCB Tank Id: 34-000-000026-000001
Tank Status: Not reported
Capacity: 2000
Active Date: Not reported
Tank Use: M.V. FUEL
STG: PRODUCT
Content: REG UNLEADED
Number Of Tanks: 1

Sacramento Co. ML:
Facility Id: Not reported
Facility Status: Not reported
FD: Not reported
Billing Codes BP: A
Billing Codes UST: Not reported
WG Bill Code: A
Target Property Bill Cod: Not reported
Food Bill Code: Not reported
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: Not reported
UST Permit Dt: Not reported
UST Inspection Date: Not reported
UST Tank Test Date: Not reported
Number of Tanks: Not reported

CALVADA SALES COMPANY (Continued) **S101590615**

UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	I

291
SE
1/4-1/2
0.485 mi.
2560 ft.

Relative:
Higher

Actual:
28 ft.

CHEVRON #9-4176 **CA HIST CORTESE** **S102316260**
1601 J ST (AKA 925 16TH STREET) **CA LUST** **N/A**
SACRAMENTO, CA 95814 **CA Sacramento Co. CS**
CA Sacramento Co. ML

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	LTNKA
Reg Id:	341117

LUST:

Region:	STATE
Global Id:	T0606700942
Latitude:	38.5781984164355
Longitude:	-121.48496568203
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	03/04/2011
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	CWL
Local Agency:	SACRAMENTO COUNTY LOP
RB Case Number:	341117
LOC Case Number:	C575
File Location:	Local Agency
Potential Media Affect:	Other Groundwater (uses other than drinking water), Soil
Potential Contaminants of Concern:	Gasoline
Site History:	A complete site history is located here.

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606700942
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0606700942
Contact Type:	Local Agency Caseworker
Contact Name:	CHARLEY LANGER
Organization Name:	SACRAMENTO COUNTY LOP
Address:	10590 ARMSTRONG AVENUE, SUITE A
City:	MATHER
Email:	langerc@saccounty.net
Phone Number:	9168758474

CHEVRON #9-4176 (Continued) **S102316260**

Status History:

Global Id:	T0606700942
Status:	Completed - Case Closed
Status Date:	03/04/2011
Global Id:	T0606700942
Status:	Open - Assessment & Interim Remedial Action
Status Date:	12/23/1996
Global Id:	T0606700942
Status:	Open - Case Begin Date
Status Date:	12/23/1996

Regulatory Activities:

Global Id:	T0606700942
Action Type:	ENFORCEMENT
Date:	05/12/2010
Action:	File review
Global Id:	T0606700942
Action Type:	ENFORCEMENT
Date:	05/12/2010
Action:	Staff Letter
Global Id:	T0606700942
Action Type:	ENFORCEMENT
Date:	03/04/2011
Action:	Closure/No Further Action Letter
Global Id:	T0606700942
Action Type:	ENFORCEMENT
Date:	04/10/2008
Action:	Technical Correspondence / Assistance / Other
Global Id:	T0606700942
Action Type:	Other
Date:	12/23/1996
Action:	Leak Discovery
Global Id:	T0606700942
Action Type:	RESPONSE
Date:	01/14/2011
Action:	Well Destruction Report
Global Id:	T0606700942
Action Type:	REMEDIATION
Date:	12/01/1996
Action:	Excavation
Global Id:	T0606700942
Action Type:	ENFORCEMENT
Date:	08/21/2007
Action:	Technical Correspondence / Assistance / Other
Global Id:	T0606700942
Action Type:	Other

CHEVRON #9-4176 (Continued) **S102316260**

Date: 12/23/1996
Action: Leak Stopped

Global Id: T0606700942
Action Type: Other
Date: 02/18/1997
Action: Leak Reported

Global Id: T0606700942
Action Type: RESPONSE
Date: 08/20/2010
Action: Soil and Water Investigation Report

Global Id: T0606700942
Action Type: ENFORCEMENT
Date: 03/10/2008
Action: File review

Global Id: T0606700942
Action Type: ENFORCEMENT
Date: 07/10/2008
Action: Meeting

Global Id: T0606700942
Action Type: ENFORCEMENT
Date: 11/26/2007
Action: Staff Letter

Global Id: T0606700942
Action Type: ENFORCEMENT
Date: 11/26/2007
Action: File review

Global Id: T0606700942
Action Type: ENFORCEMENT
Date: 05/30/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0606700942
Action Type: ENFORCEMENT
Date: 09/25/2008
Action: File review

Global Id: T0606700942
Action Type: ENFORCEMENT
Date: 01/09/2009
Action: File review

Global Id: T0606700942
Action Type: ENFORCEMENT
Date: 04/07/2009
Action: File review

Global Id: T0606700942
Action Type: ENFORCEMENT
Date: 08/20/2009
Action: File Review - Closure

CHEVRON #9-4176 (Continued) **S102316260**

Global Id: T0606700942
Action Type: ENFORCEMENT
Date: 11/12/2010
Action: Staff Letter

LUST REG 5:
Region: 5
Status: Leak being confirmed
Case Number: 341117
Case Type: Soil only
Substance: GASOLINE
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

Sacramento Co. CS:
State Site Number: C575
Lead Staff: Langer, C.
Lead Agency: HM
Remedial Action Taken: NO
Substance: Automotive(motor gasoline and additives)
Date Reported: 12/23/1996
Facility Id: RO0000644
Case Type: Soil only
Case Closed: Not reported
Date Closed: Not reported

Sacramento Co. ML:
Facility Id: U0081386
Facility Status: Inactive. Included on a listing no longer updated.
FD: U
Billing Codes BP: Out of Business
Billing Codes UST: No Tanks
WG Bill Code: Oil Changed by Outside Company-No Fee
Target Property Bill Cod: 51
Food Bill Code: 51
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: 04/19/1996
UST Permit Dt: 03/09/1987
UST Inspection Date: 05/24/1991
UST Tank Test Date: 08/22/1990
Number of Tanks: 0
UST Tank Test Date: Not reported
SIC Code: 5541
Tier Permitting: Not reported
AST Bill Code: Not reported
CALARP Bill Code: Not reported

AY292 **FREDERICKSEN TANK LINES** **CA NPDES** **S100935633**
SW **850 DELTA LN** **CA HIST CORTESE** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691** **CA LUST**
0.492 mi.
2596 ft. **Site 1 of 2 in cluster AY**

Relative:
Higher

Actual:
23 ft.

NPDES:

Npdes Number:	CAS000001
Facility Status:	Terminated
Agency Id:	0
Region:	5S
Regulatory Measure Id:	202990
Order No:	97-03-DWQ
Regulatory Measure Type:	Enrollee
Place Id:	Not reported
WDID:	5S57I001755
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	03/30/1992
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	06/27/2012
Discharge Name:	Fredericksen Tank Lines Inc
Discharge Address:	PO Box 717
Discharge City:	West Sacramento
Discharge State:	California
Discharge Zip:	95691

HIST CORTESE:

Region:	CORTESE
Facility County Code:	57
Reg By:	LTNKA
Reg Id:	570046

LUST:

Region:	STATE
Global Id:	T0611300031
Latitude:	38.579615651
Longitude:	-121.517650928
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	05/27/2010
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	DFS
Local Agency:	Not reported
RB Case Number:	570046
LOC Case Number:	Not reported
File Location:	Regional Board
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0611300031
Contact Type:	Regional Board Caseworker
Contact Name:	DAVID STAVAREK
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200

FREDERICKSEN TANK LINES (Continued) **S100935633**

City: RANCHO CORDOVA
Email: dstavarek@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0611300031
Status: Completed - Case Closed
Status Date: 05/27/2010

Global Id: T0611300031
Status: Open - Case Begin Date
Status Date: 08/17/1988

Global Id: T0611300031
Status: Open - Remediation
Status Date: 11/06/1997

Global Id: T0611300031
Status: Open - Remediation
Status Date: 12/10/1997

Global Id: T0611300031
Status: Open - Remediation
Status Date: 08/04/1998

Global Id: T0611300031
Status: Open - Site Assessment
Status Date: 08/17/1988

Global Id: T0611300031
Status: Open - Site Assessment
Status Date: 10/15/1992

Global Id: T0611300031
Status: Open - Site Assessment
Status Date: 07/24/2000

Global Id: T0611300031
Status: Open - Site Assessment
Status Date: 04/07/2004

Regulatory Activities:
Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 05/03/2001
Action: * Historical Enforcement

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 07/22/2003
Action: * Historical Enforcement

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 03/29/2004
Action: * Verbal Communication

FREDERICKSEN TANK LINES (Continued) **S100935633**

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 03/09/2010
Action: Staff Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 03/05/2010
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 05/27/2010
Action: Closure/No Further Action Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 05/04/2010
Action: Staff Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 06/10/2003
Action: Site Visit / Inspection / Sampling

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 01/12/2004
Action: Site Visit / Inspection / Sampling

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 01/30/2004
Action: Site Visit / Inspection / Sampling

Global Id: T0611300031
Action Type: RESPONSE
Date: 04/30/2002
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 10/30/2001
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 01/30/2003
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 10/30/2003
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE

FREDERICKSEN TANK LINES (Continued) **S100935633**

Date: 01/30/2002
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 07/30/2002
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 07/13/2001
Action: CAP/RAP - Final Remediation / Design Plan

Global Id: T0611300031
Action Type: RESPONSE
Date: 04/30/2004
Action: Soil and Water Investigation Workplan

Global Id: T0611300031
Action Type: RESPONSE
Date: 09/19/2003
Action: Interim Remedial Action Plan

Global Id: T0611300031
Action Type: RESPONSE
Date: 04/30/2003
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 07/31/2003
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 07/23/2004
Action: CAP/RAP - Feasibility Study Report

Global Id: T0611300031
Action Type: RESPONSE
Date: 08/13/2009
Action: Clean Up Fund - 5-Year Review Summary

Global Id: T0611300031
Action Type: REMEDIATION
Date: 04/10/2007
Action: Excavation

Global Id: T0611300031
Action Type: REMEDIATION
Date: 10/29/2003
Action: In Situ Physical/Chemical Treatment (other than SVE)

Global Id: T0611300031
Action Type: REMEDIATION
Date: 01/10/1988
Action: Excavation

FREDERICKSEN TANK LINES (Continued) **S100935633**

Global Id: T0611300031
Action Type: REMEDIATION
Date: 01/20/2004
Action: Excavation

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 10/15/2003
Action: * Historical Enforcement

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 10/24/2006
Action: Staff Letter

Global Id: T0611300031
Action Type: RESPONSE
Date: 01/30/2004
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 04/30/2004
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 07/30/2004
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: REMEDIATION
Date: 04/10/1987
Action: Other (Use Description Field)

Global Id: T0611300031
Action Type: REMEDIATION
Date: 04/10/1988
Action: Excavation

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 09/14/2006
Action: Staff Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 02/27/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 08/22/2006
Action: Meeting

Global Id: T0611300031
Action Type: ENFORCEMENT

FREDERICKSEN TANK LINES (Continued) **S100935633**

Date: 01/10/2004
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 07/26/2007
Action: Verbal Communication

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 08/29/2007
Action: Staff Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 09/14/2006
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 08/30/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 02/05/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 08/23/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 10/11/2002
Action: File review

Global Id: T0611300031
Action Type: RESPONSE
Date: 09/30/2007
Action: Other Workplan

Global Id: T0611300031
Action Type: RESPONSE
Date: 10/31/2006
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 10/30/2004
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 07/30/2005
Action: Monitoring Report - Quarterly

FREDERICKSEN TANK LINES (Continued) **S100935633**

Global Id: T0611300031
Action Type: RESPONSE
Date: 10/31/2005
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 01/30/2006
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 07/22/2003
Action: Staff Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 05/10/1999
Action: Staff Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 10/15/2003
Action: Staff Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 04/16/2007
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 06/16/2000
Action: Soil and Water Investigation Workplan

Global Id: T0611300031
Action Type: RESPONSE
Date: 10/20/2000
Action: Other Workplan

Global Id: T0611300031
Action Type: RESPONSE
Date: 01/31/2007
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 12/08/2006
Action: Interim Remedial Action Plan

Global Id: T0611300031
Action Type: RESPONSE
Date: 12/31/2004
Action: Tank Removal Report / UST Sampling Report

Global Id: T0611300031
Action Type: RESPONSE

FREDERICKSEN TANK LINES (Continued) **S100935633**

Date: 09/05/2006
Action: Other Workplan

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 12/10/2007
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 06/03/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 03/07/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 04/01/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 07/01/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 06/05/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 02/28/2008
Action: Verbal Communication

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 10/09/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 10/09/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: Other
Date: 08/17/1988
Action: Leak Reported

Global Id: T0611300031
Action Type: RESPONSE
Date: 12/05/2008
Action: Correspondence

FREDERICKSEN TANK LINES (Continued) **S100935633**

Global Id: T0611300031
Action Type: RESPONSE
Date: 12/08/2008
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 10/31/2008
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 07/31/2006
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 07/30/2007
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 05/03/2001
Action: Staff Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 02/11/2008
Action: Verbal Communication

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 03/04/2008
Action: Verbal Communication

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 05/28/2009
Action: Staff Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 04/23/2007
Action: Site Visit / Inspection / Sampling

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 05/07/2007
Action: Verbal Communication

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 08/21/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT

FREDERICKSEN TANK LINES (Continued) **S100935633**

Date: 07/08/2008
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 01/29/2009
Action: Staff Letter

Global Id: T0611300031
Action Type: RESPONSE
Date: 03/04/2008
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 11/30/2007
Action: Risk Assessment Report

Global Id: T0611300031
Action Type: RESPONSE
Date: 04/30/2008
Action: Risk Assessment Report

Global Id: T0611300031
Action Type: RESPONSE
Date: 10/31/2008
Action: Other Report / Document

Global Id: T0611300031
Action Type: RESPONSE
Date: 04/30/2007
Action: Remedial Progress Report

Global Id: T0611300031
Action Type: RESPONSE
Date: 12/05/2008
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 01/21/2009
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 11/09/2009
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 12/12/2008
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 01/12/2009
Action: Verbal Communication

FREDERICKSEN TANK LINES (Continued) **S100935633**

Global Id: T0611300031
Action Type: RESPONSE
Date: 07/24/2008
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 04/30/2007
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 04/30/2008
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 10/30/2002
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 07/27/2009
Action: Staff Letter

Global Id: T0611300031
Action Type: RESPONSE
Date: 04/10/2009
Action: Other Workplan

Global Id: T0611300031
Action Type: RESPONSE
Date: 07/31/2008
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 01/31/2009
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 11/04/2009
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 10/30/2009
Action: Other Workplan

Global Id: T0611300031
Action Type: RESPONSE
Date: 11/23/2009
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE

FREDERICKSEN TANK LINES (Continued) **S100935633**

Date: 05/21/2009
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 10/19/2009
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 05/11/2009
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 07/14/2009
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 02/18/2009
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 01/15/2010
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 04/30/2006
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 12/07/2009
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 03/08/2010
Action: Verbal Communication

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 05/10/2000
Action: Staff Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 08/16/2000
Action: Staff Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 07/28/2009
Action: Meeting

FREDERICKSEN TANK LINES (Continued) **S100935633**

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 05/03/2004
Action: Staff Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 09/28/2009
Action: Staff Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 12/14/2009
Action: Meeting

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 05/27/2004
Action: Staff Letter

Global Id: T0611300031
Action Type: ENFORCEMENT
Date: 01/10/2010
Action: Technical Correspondence / Assistance / Other

Global Id: T0611300031
Action Type: RESPONSE
Date: 07/20/2009
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 08/25/2008
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 02/09/2009
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 12/02/2009
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 01/04/2010
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 09/25/2009
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE

FREDERICKSEN TANK LINES (Continued) **S100935633**

Date: 12/16/2009
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 02/16/2009
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 11/24/2009
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 08/18/2009
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 08/27/2009
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 10/19/2009
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 04/14/2009
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 09/01/2009
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 08/13/2009
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 04/30/2009
Action: Monitoring Report - Quarterly

Global Id: T0611300031
Action Type: RESPONSE
Date: 10/19/2009
Action: Correspondence

Global Id: T0611300031
Action Type: RESPONSE
Date: 05/19/2010
Action: Verbal Communication

FREDERICKSEN TANK LINES (Continued) **S100935633**

Global Id: T0611300031
Action Type: RESPONSE
Date: 05/03/2010
Action: Verbal Communication

Global Id: T0611300031
Action Type: RESPONSE
Date: 06/11/2010
Action: Well Destruction Report

AY293 **FREDERICKSEN TANK LINES** **CA LUST** **S105032981**
SW **850 DELTA LN** **CA WDS** **N/A**
1/4-1/2 **WEST SACRAMENTO, CA 95691**
0.492 mi.
2596 ft. **Site 2 of 2 in cluster AY**

Relative:
Higher

Actual:
23 ft.

LUST REG 5:
Region: 5
Status: Pollution Characterization
Case Number: 570046
Case Type: Drinking Water Aquifer affected
Substance: GASOLINE
Staff Initials: DFS
Lead Agency: Regional
Program: LUST
MTBE Code: 1

WDS:
Facility ID: 5S 57I001755
Facility Type: Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Status: Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number: CAS000001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board
Subregion: 0
Facility Telephone: 9163714655
Facility Contact: RICHARD FREITAS
Agency Name: FREDERICKSEN TANK LINES INC
Agency Address: 850 DELTA LANE
Agency City,St,Zip: West Sacramento 956910717
Agency Contact: RICHARD FREITAS
Agency Telephone: 9163714655
Agency Type: Private
SIC Code: 4213
SIC Code 2: Not reported
Primary Waste Type: Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste).
Primary Waste: STORMS

FREDERICKSEN TANK LINES (Continued) **S105032981**

Waste Type2:	Not reported
Waste2:	Stormwater Runoff
Primary Waste Type:	Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste).
Secondary Waste:	Not reported
Secondary Waste Type:	Not reported
Design Flow:	0
Baseline Flow:	0
Reclamation:	No reclamation requirements associated with this facility.
POTW:	The facility is not a POTW.
Treat To Water:	Minor Threat to Water Quality. A violation of a regional board order should cause a relatively minor impairment of beneficial uses compared to a major or minor threat. Not: All nurds without a TTWQ will be considered a minor threat to water quality unless coded at a higher Level. A Zero (0) may be used to code those NURDS that are found to represent no threat to water quality.
Complexity:	Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds.

AZ294 **SALKEY BROTHERS, INC.** **CA Sacramento Co. CS** **U001615187**
NE **500 SEQUOIA PACIFIC BLVD** **CA HIST UST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814** **CA CHMIRS**
0.493 mi. **CA Sacramento Co. ML**
2601 ft. **Site 1 of 3 in cluster AZ**

Relative:
Higher

Actual:
23 ft.

Sacramento Co. CS:

State Site Number:	C551
Lead Staff:	Marcus, B.
Lead Agency:	HM
Remedial Action Taken:	YE, S
Substance:	Automotive(motor gasoline and additives)
Date Reported:	03/05/1993
Facility Id:	RO0001056
Case Type:	Soil only
Case Closed:	Y
Date Closed:	**12/05/1994**

HIST UST:

Region:	STATE
Facility ID:	00000023095
Facility Type:	Other
Other Type:	WHOLESALER
Contact Name:	BEN LASALA
Telephone:	9164411481
Owner Name:	SLAKEY BROTHERS, INC.
Owner Address:	500 SEQUOIA PACIFIC BOULEVARD
Owner City,St,Zip:	SACRAMENTO, CA 95814
Total Tanks:	0002
Tank Num:	001

SALKEY BROTHERS, INC. (Continued) **U001615187**

Container Num:	#1 GASOLIN
Year Installed:	1979
Tank Capacity:	00006000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	14
Leak Detection:	Stock Inventor, None

Tank Num:	002
Container Num:	#2 (DIESEL
Year Installed:	1979
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	14
Leak Detection:	Stock Inventor, None

CHMIRS:

OES Incident Number:	11-0172
OES notification:	01/10/2011
OES Date:	Not reported
OES Time:	Not reported
Incident Date:	Not reported
Date Completed:	**Not reported**
Property Use:	Not reported
Agency Id Number:	Not reported
Agency Incident Number:	Not reported
Time Notified:	Not reported
Time Completed:	Not reported
Surrounding Area:	Not reported
Estimated Temperature:	Not reported
Property Management:	Not reported
More Than Two Substances Involved?:	Not reported
Resp Agncy Personel # Of Decontaminated:	Not reported
Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported
Others Number Of Fatalities:	Not reported
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA DOT PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	No
Waterway:	Not reported
Spill Site:	Merchant/Business
Cleanup By:	Contractor
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Gal(s)
Other:	Not reported

SALKEY BROTHERS, INC. (Continued) **U001615187**

Date/Time:	1333
Year:	2011
Agency:	Hazmat 1
Incident Date:	1/10/2011
Admin Agency:	Sacramento City Fire Department
Amount:	Not reported
Contained:	Yes
Site Type:	Not reported
E Date:	Not reported
Substance:	Water based paint
Quantity Released:	10
Unknown:	Not reported
Substance #2:	Not reported
Substance #3:	Not reported
Evacuations:	Not reported
Number of Injuries:	Not reported
Number of Fatalities:	Not reported
#1 Pipeline:	Not reported
#2 Pipeline:	Not reported
#3 Pipeline:	Not reported
#1 Vessel >= 300 Tons:	Not reported
#2 Vessel >= 300 Tons:	Not reported
#3 Vessel >= 300 Tons:	Not reported
Evacs:	Not reported
Injuries:	Not reported
Fatals:	Not reported
Comments:	Not reported
Description:	Caller states that the pail shifted in the trailer during transit.

Sacramento Co. ML:

Facility Id:	Not reported
Facility Status:	Not reported
FD:	Not reported
Billing Codes BP:	I
Billing Codes UST:	Not reported
WG Bill Code:	Not reported
Target Property Bill Cod:	Not reported
Food Bill Code:	Not reported
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	Not reported
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

AZ295 **SLAKEY BROS INC** **CA HIST CORTESE** **S105025979**
NE **500 SEQUOIA-PACIFIC BLVD** **CA LUST** **N/A**
1/4-1/2 **SACRAMENTO, CA 95814**
0.493 mi.
2601 ft. **Site 2 of 3 in cluster AZ**

Relative:
Higher

Actual:
23 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	LTNKA
Reg Id:	340846

LUST:

Region:	STATE
Global Id:	T0606700698
Latitude:	38.598155
Longitude:	-121.497818
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	05/28/1996
Lead Agency:	SACRAMENTO COUNTY LOP
Case Worker:	Not reported
Local Agency:	Not reported
RB Case Number:	340846
LOC Case Number:	C551
File Location:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0606700698
Contact Type:	Regional Board Caseworker
Contact Name:	VERA FISCHER
Organization Name:	CENTRAL VALLEY RWQCB (REGION 5S)
Address:	11020 SUN CENTER DRIVE #200
City:	RANCHO CORDOVA
Email:	vera.fischer@waterboards.ca.gov
Phone Number:	Not reported

Status History:

Global Id:	T0606700698
Status:	Open - Case Begin Date
Status Date:	03/05/1993
Global Id:	T0606700698
Status:	Open - Remediation
Status Date:	01/14/1994
Global Id:	T0606700698
Status:	Completed - Case Closed
Status Date:	05/28/1996
Global Id:	T0606700698
Status:	Open - Site Assessment
Status Date:	03/05/1993

SLAKEY BROS INC (Continued) **S105025979**

Global Id: T0606700698
Status: Open - Site Assessment
Status Date: 04/09/1993

Global Id: T0606700698
Status: Open - Site Assessment
Status Date: 01/04/1994

Regulatory Activities:
Global Id: T0606700698
Action Type: Other
Date: 03/05/1993
Action: Leak Discovery

Global Id: T0606700698
Action Type: Other
Date: 05/06/1993
Action: Leak Reported

LUST REG 5:
Region: 5
Status: Case Closed
Case Number: 340846
Case Type: Soil only
Substance: GASOLINE
Staff Initials: VJF
Lead Agency: Local
Program: LUST
MTBE Code: N/A

296
ENE
1/2-1
0.518 mi.
2735 ft.

Relative:
Higher

Actual:
24 ft.

UNION PACIFIC BANNON STREET PARCEL **CA VCP** **S107737487**
NORTH B STREET AND SEVENTH STREET **CA ENVIROSTOR** **N/A**
SACRAMENTO, CA 95814

VCP:
Facility ID: 70000028
Site Type: Voluntary Cleanup
Site Type Detail: Voluntary Cleanup
Site Mgmt. Req.: NONE SPECIFIED
Acres: 4.95
National Priorities List: NO
Cleanup Oversight Agencies: SMBRP
Lead Agency: SMBRP
Lead Agency Description: DTSC - Site Cleanup Program
Project Manager: Duane White
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Site Code: 101764
Assembly: 07
Senate: 06
Special Programs Code: Not reported
Status: Active
Status Date: 08/26/2005
Restricted Use: NO

UNION PACIFIC BANNON STREET PARCEL (Continued) **S107737487**

Funding: Responsible Party
Lat/Long: 38.59336 / -121.4933
APN: NONE SPECIFIED
Past Use: RAILROAD RIGHT OF WAY, RAIL ROAD MAINTENANCE SHOP
Potential COC: 30001, 30013, 30013
Confirmed COC: 30001,30013,, ,30013
Potential Description: SOIL
Alias Name: 110033608941
Alias Type: EPA (FRS #)
Alias Name: 101764
Alias Type: Project Code (Site Code)
Alias Name: 70000028
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 10/04/2012
Comments: Emails received and / or sent

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 05/30/2006
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 09/30/2006
Comments: Completed

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Feasibility Study Workplan
Completed Date: 09/08/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 08/21/2012
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 07/01/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 08/17/2005
Comments: Not reported

Future Area Name: PROJECT WIDE

UNION PACIFIC BANNON STREET PARCEL (Continued) **S107737487**

Future Sub Area Name: Not reported
Future Document Type: Land Use Restriction
Future Due Date: 2015
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Remedial Investigation Report
Future Due Date: 2015
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

ENVIROSTOR:
Facility ID: 70000028
Status: Active
Status Date: 08/26/2005
Site Code: 101764
Site Type: Voluntary Cleanup
Site Type Detailed: Voluntary Cleanup
Acres: 4.95
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Duane White
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.59336
Longitude: -121.4933
APN: NONE SPECIFIED
Past Use: RAILROAD RIGHT OF WAY, RAIL ROAD MAINTENANCE SHOP
Potential COC: Arsenic Lead Lead
Confirmed COC: Arsenic Lead Lead
Potential Description: SOIL
Alias Name: 110033608941
Alias Type: EPA (FRS #)
Alias Name: 101764
Alias Type: Project Code (Site Code)
Alias Name: 70000028
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 10/04/2012
Comments: Emails received and / or sent

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan

UNION PACIFIC BANNON STREET PARCEL (Continued) **S107737487**

Completed Date: 05/30/2006
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 09/30/2006
Comments: Completed

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Feasibility Study Workplan
Completed Date: 09/08/2008
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 08/21/2012
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 07/01/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 08/17/2005
Comments: Not reported

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Land Use Restriction
Future Due Date: 2015
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Remedial Investigation Report
Future Due Date: 2015
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

AZ297 **BIGGERS INDUSTRIAL GERLINGER** **CA HIST CORTESE** **S100275552**
NE **551 SEQUOIA PACIFIC BOULEVARD** **CA CHMIRS** **N/A**
1/2-1 **SACRAMENTO, CA 95814** **CA ENVIROSTOR**
0.520 mi.
2743 ft. **Site 3 of 3 in cluster AZ**

Relative:
Higher

Actual:
23 ft.

HIST CORTESE:
Region: CORTESE
Facility County Code: 34
Reg By: CALSI
Reg Id: 34340018

BIGGERS INDUSTRIAL GERLINGER (Continued) **S100275552**

CHMIRS:

OES Incident Number:	9000520
OES notification:	Not reported
OES Date:	Not reported
OES Time:	Not reported
Incident Date:	07-MAR-90
Date Completed:	**07-MAR-90**
Property Use:	500
Agency Id Number:	34080
Agency Incident Number:	7459
Time Notified:	1511
Time Completed:	1623
Surrounding Area:	500
Estimated Temperature:	Not reported
Property Management:	Not reported
More Than Two Substances Involved?:	N
Resp Agncy Personel # Of Decontaminated:	0
Responding Agency Personel # Of Injuries:	0
Responding Agency Personel # Of Fatalities:	0
Others Number Of Decontaminated:	0
Others Number Of Injuries:	0
Others Number Of Fatalities:	0
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA DOT PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	STEVE AYALA CAPTAIN T-20-A
Report Date:	07-MAR-90
Facility Telephone:	916 449-5266
Waterway Involved:	Not reported
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	Not reported
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	88-92
Agency:	Not reported
Incident Date:	Not reported
Admin Agency:	Not reported
Amount:	Not reported
Contained:	Not reported
Site Type:	Not reported
E Date:	29-MAY-90
Substance:	Not reported
Unknown:	Not reported
Substance #2:	Not reported
Substance #3:	Not reported
Evacuations:	Not reported
Number of Injuries:	Not reported
Number of Fatalities:	Not reported
#1 Pipeline:	Not reported

BIGGERS INDUSTRIAL GERLINGER (Continued) **S100275552**

#2 Pipeline:	Not reported
#3 Pipeline:	Not reported
#1 Vessel >= 300 Tons:	Not reported
#2 Vessel >= 300 Tons:	Not reported
#3 Vessel >= 300 Tons:	Not reported
Evacs:	Not reported
Injuries:	Not reported
Fatals:	Not reported
Comments:	Not reported
Description:	Not reported

ENVIROSTOR:

Facility ID:	34340018
Status:	No Further Action
Status Date:	09/30/1992
Site Code:	100239
Site Type:	Historical
Site Type Detailed:	* Historical
Acres:	0
NPL:	NO
Regulatory Agencies:	NONE SPECIFIED
Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	Steven Becker
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not reported
Latitude:	38.59902
Longitude:	-121.4960
APN:	00102000350000
Past Use:	ILLEGAL DUMPING, ILLEGAL DUMPING, METAL PLATING - CHROME, METAL PLATING - OTHER
Potential COC:	* CONTAMINATED SOIL Lead Chromium VI Lead Chromium VI
Confirmed COC:	Lead Chromium VI
Potential Description:	OTH, SOIL, CSS, OTH, SOIL
Alias Name:	00102000350000
Alias Type:	APN
Alias Name:	100239
Alias Type:	Project Code (Site Code)
Alias Name:	34340018
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	* Discovery
Completed Date:	01/05/1988
Comments:	FACILITY IDENTIFIED COMPLAINT RECEIVED INDICATING 55-GALLON DRUMS BEING DUMPED AT RAILROAD TRACKS.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Screening

BIGGERS INDUSTRIAL GERLINGER (Continued) **S100275552**

Completed Date:	12/18/1989
Comments:	SITE SCREENING DONE PROPERTY OWNED BY MARVIN OATES AND RICK MASSIE. GENERAL WASTE REMOVAL COMPLETED IN 1988. NO CLEANUP DONE IN AREA OF DRAIN; RECOMMEND PRELIMINARY ENDANGER- MENT ASSESSMENT (MEDIUM PRIORITY).
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Screening
Completed Date:	12/06/1989
Comments:	SITE SCREENING DONE LETTER SENT TO REQUEST DOCUMENTATION OF CLEAN-UP (IF ANY).
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Report
Completed Date:	09/30/1992
Comments:	PEA completed. Low levels of CrVI were detected in the shallow (15ft) ground water (.023 ppm). Elevated lead and chromium seem in 1988 S&E investigation apparently were removed with a railroad spur sometime during the transfer of ownership. Remaining lead and chromium are at acceptable levels for the current and projected land use of commercial/ industrial. No further action required by DTSC. RWQCB informed of low CrVI levels.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	* Expedited Response Action
Completed Date:	06/29/1992
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

298
SSW
1/2-1
0.550 mi.
2905 ft.

VAN WATERS AND ROGERS, INC
850 SOUTH RIVER ROAD
WEST SACRAMENTO, CA 95691

CA HIST CORTESE **S105027374**
CA SLIC **N/A**
CA ENVIROSTOR

Relative:
Higher

Actual:
33 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	57
Reg By:	LTNKA
Reg Id:	570059

SLIC:

Region:	STATE
Facility Status:	**Open - Verification Monitoring**
Status Date:	06/01/2000

VAN WATERS AND ROGERS, INC (Continued) **S105027374**

Global Id:	SL205423013
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	Not reported
Latitude:	38.5795803843556
Longitude:	-121.513345396851
Case Type:	Cleanup Program Site
Case Worker:	BSS
Local Agency:	Not reported
RB Case Number:	SL205423013
File Location:	Regional Board
Potential Media Affected:	Not reported
Potential Contaminants of Concern:	Not reported
Site History:	The property is currently occupied by the River City Baseball Group, the current owner and operator of the ballpark facility, a new multi-use open-air structure stadium that serves as the home for the Sacramento River Cats. Univar USA Inc. (Formerly Van Waters & Rogers) purchased the facility in 1959 for chemical storage and distribution operations, resulting in the storage, handling, and re-packaging of PCE; 1,1,1-TCA, acetic acid, acetone, Texanol, diesel, and propylene glycol. These chemical distribution operations at the site caused contamination of soil and groundwater with solvents, mostly PCE, TCE, vinyl chloride, cis-1,2-DCE and trans-1,2-DCE. Initial cleanup operations for soil and groundwater were incorporated into the stadium design during construction of Raley Field. Univar USA Inc. is primarily responsible for the environmental cleanup operations at the site. Site investigative activities were initiated in 1988 in response to potential leaks from Underground Storage Tanks (USTs). The USTs were subsequently removed in 1991 and since then, no chemicals have been stored in bulk at the site. Univar operated soil vapor extraction/air sparging from 1995 to 1997. In 1999, the system was decommissioned and a combination of in-situ bioremediation and groundwater extraction and treatment systems were installed. Groundwater is being amended with a food source (sodium lactate) and nutrients to stimulate the growth of indigenous bacteria for enhanced anaerobic dechlorination.

Click here to access the California GeoTracker records for this facility:

ENVIROSTOR:

Facility ID:	57510003
Status:	Refer: RWQCB
Status Date:	11/17/1989
Site Code:	Not reported
Site Type:	Evaluation
Site Type Detailed:	Evaluation
Acres:	2.5
NPL:	NO
Regulatory Agencies:	RWQCB 5S - Central Valley
Lead Agency:	RWQCB 5S - Central Valley
Program Manager:	Not reported
Supervisor:	Steven Becker
Division Branch:	Cleanup San Joaquin
Assembly:	07
Senate:	06
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED

VAN WATERS AND ROGERS, INC (Continued) **S105027374**

Funding: Not reported
Latitude: 38.57918
Longitude: -121.5128
APN: 058 320 24
Past Use: NONE SPECIFIED
Potential COC: * HALOGENATED SOLVENTS
Confirmed COC: NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: 058 320 24
Alias Type: APN
Alias Name: 110002334787
Alias Type: EPA (FRS #)
Alias Name: 57510003
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment Report
Completed Date: 06/14/2010
Comments: USEPA completed a Preliminary Assessment for this site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 11/17/1989
Comments: REGIONAL WATER QUALITY CONTROL BOARD (RWQCB) SITE. RWQCB HAS RECEIVED PHASE II SITE INVESTI GATION REPORT FOR REVIEW. SITE SCREENING DONE. RWQCB ACTIVE IN INVESTIGATION OF GROUND- WATER CONTAMINATION. WASTE FOUND IN GROUNDWATER KNOWN TO HAVE BEEN HANDLED AT SITE.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 07/26/2000
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 03/14/1988
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

299
SW
1/2-1
0.611 mi.
3227 ft.

SACRAMENTO STUCCO COMPANY
860 RISKE LANE
SAME, CA 95691

CA HIST UST **U001614249**
CA VCP **N/A**
CA ENVIROSTOR

Relative:
Higher

Actual:
36 ft.

HIST UST:

Region:	STATE
Facility ID:	00000065175
Facility Type:	Other
Other Type:	BLDG. MATERIAL
Contact Name:	L.A. WINCHELL JR.
Telephone:	9163727442
Owner Name:	SACRAMENTO STUCCO COMPANY
Owner Address:	860 RISKE LANE
Owner City,St,Zip:	WEST SACRAMENTO, CA 95691
Total Tanks:	0002
Tank Num:	001
Container Num:	#1-GAS
Year Installed:	1982
Tank Capacity:	00004000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	Pressure Test
Tank Num:	002
Container Num:	#2 DIESEL
Year Installed:	1982
Tank Capacity:	00008000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	Not reported
Leak Detection:	Pressure Test

VCP:

Facility ID:	60000284
Site Type:	Voluntary Cleanup
Site Type Detail:	Voluntary Cleanup
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	2.86
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Leona Winner
Supervisor:	Steven Becker
Division Branch:	Cleanup San Joaquin
Site Code:	101782
Assembly:	07
Senate:	06
Special Programs Code:	Voluntary Cleanup Program
Status:	Inactive - Action Required
Status Date:	09/18/2008
Restricted Use:	NO
Funding:	Responsible Party
Lat/Long:	38.57774 / -121.5167
APN:	058 310 18, 058-310-18, 058-310-19

SACRAMENTO STUCCO COMPANY (Continued) **U001614249**

Past Use:	BATTERY RECLAMATION, BATTERY STORAGE
Potential COC:	30343
Confirmed COC:	30343
Potential Description:	SOIL
Alias Name:	058 310 18
Alias Type:	APN
Alias Name:	058-310-18
Alias Type:	APN
Alias Name:	058-310-19
Alias Type:	APN
Alias Name:	110002408181
Alias Type:	EPA (FRS #)
Alias Name:	101782
Alias Type:	Project Code (Site Code)
Alias Name:	60000284
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Characterization Workplan
Completed Date:	08/07/2006
Comments:	Workplan for additional soil investigation was approved. Final letted was uploaded under Preliminary Endangerment Assessment (PEA). We approved the PEA and workplan in the same letter.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Report
Completed Date:	08/07/2006
Comments:	PEA equivalent documentation was reviewed and further investigation is necessary.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Characterization Report
Completed Date:	03/19/2007
Comments:	Not reported

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Removal Action Workplan
Completed Date:	09/11/2008
Comments:	Removal Action Workplan is approved. However, the drop in the economy has delayed this project.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Fact Sheets
Completed Date:	07/28/2008
Comments:	Public Comment Period began 7/28/2008.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Public Notice
Completed Date:	07/28/2008
Comments:	Public Comment Period begins July 28, 2008.

SACRAMENTO STUCCO COMPANY (Continued) **U001614249**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Amendment - Order/Agreement
Completed Date: 10/26/2007
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 09/08/2008
Comments: CEQA NOE signed and filed with the State Clearinghouse.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 04/25/2006
Comments: A Voluntary Cleanup Agreement was executed. The agreement calls for the completion of a Preliminary Endangerment Assessment. Acopy was transmitted to the Proponent on 4/28/2006.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

ENVIROSTOR:
Facility ID: 60000284
Status: Inactive - Action Required
Status Date: 09/18/2008
Site Code: 101782
Site Type: Voluntary Cleanup
Site Type Detailed: Voluntary Cleanup
Acres: 2.86
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Leona Winner
Supervisor: Steven Becker
Division Branch: Cleanup San Joaquin
Assembly: 07
Senate: 06
Special Program: Voluntary Cleanup Program
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.57774
Longitude: -121.5167
APN: 058 310 18, 058-310-18, 058-310-19
Past Use: BATTERY RECLAMATION, BATTERY STORAGE
Potential COC: Lead, Organic (tetraethyl lead
Confirmed COC: Lead, Organic (tetraethyl lead
Potential Description: SOIL

SACRAMENTO STUCCO COMPANY (Continued) **U001614249**

Alias Name: 058 310 18
Alias Type: APN
Alias Name: 058-310-18
Alias Type: APN
Alias Name: 058-310-19
Alias Type: APN
Alias Name: 110002408181
Alias Type: EPA (FRS #)
Alias Name: 101782
Alias Type: Project Code (Site Code)
Alias Name: 60000284
Alias Type: Envirostor ID Number

Completed Info:

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Workplan
Completed Date: 08/07/2006
Comments: Workplan for additional soil investigation was approved. Final letted was uploaded under Preliminary Endangerment Assessment (PEA). We approved the PEA and workplan in the same letter.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 08/07/2006
Comments: PEA equivalent documentation was reviewed and further investigation is necessary.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 03/19/2007
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 09/11/2008
Comments: Removal Action Workplan is approved. However, the drop in the economy has delayed this project.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fact Sheets
Completed Date: 07/28/2008
Comments: Public Comment Period began 7/28/2008.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Notice
Completed Date: 07/28/2008
Comments: Public Comment Period begins July 28, 2008.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Amendment - Order/Agreement
Completed Date: 10/26/2007

SACRAMENTO STUCCO COMPANY (Continued) **U001614249**

Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	CEQA - Notice of Exemption
Completed Date:	09/08/2008
Comments:	CEQA NOE signed and filed with the State Clearinghouse.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Voluntary Cleanup Agreement
Completed Date:	04/25/2006
Comments:	A Voluntary Cleanup Agreement was executed. The agreement calls for the completion of a Preliminary Endangerment Assessment. Acopy was transmitted to the Proponent on 4/28/2006.
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

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300 WSW 1/2-1 0.651 mi. 3439 ft. **SUNSHINE LAUNDRY AND CLEANERS** **CA ENVIROSTOR** **S100190978**
820 MERKLEY AVENUE **N/A**
WEST SACRAMENTO, CA 95691

Relative: Higher

Actual: 25 ft.

ENVIROSTOR:

Facility ID:	57720003
Status:	Refer: Other Agency
Status Date:	11/16/1994
Site Code:	Not reported
Site Type:	Evaluation
Site Type Detailed:	Evaluation
Acres:	Not reported
NPL:	NO
Regulatory Agencies:	NONE SPECIFIED
Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	Steven Becker
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not reported
Latitude:	38.58063
Longitude:	-121.5230
APN:	067 310 05
Past Use:	NONE SPECIFIED
Potential COC:	NONE SPECIFIED
Confirmed COC:	NONE SPECIFIED

SUNSHINE LAUNDRY AND CLEANERS (Continued) **S100190978**

Potential Description: NONE SPECIFIED
Alias Name: 067 310 05
Alias Type: APN
Alias Name: 57720003
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 07/26/2000
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

301
East
1/2-1
0.676 mi.
3571 ft.

BURNETT & SONS **CA Notify 65** **U000073130**
11TH & C STREETS **N/A**
SACRAMENTO, CA 92324

Relative:
Higher

Actual:
27 ft.

NOTIFY 65:
Date Reported: Not reported
Staff Initials: Not reported
Board File Number: Not reported
Facility Type: Not reported
Discharge Date: Not reported
Incident Description: 92324

302
SSE
1/2-1
0.689 mi.
3636 ft.

MATHER STORAGE ANX (J09CA0081) **CA ENVIROSTOR** **S107736695**
N/A
SACRAMENTO, CA

Relative:
Higher

Actual:
19 ft.

ENVIROSTOR:
Facility ID: 80000054
Status: No Further Action
Status Date: 10/30/2014
Site Code: Not reported
Site Type: Military Evaluation
Site Type Detailed: FUDS
Acres: 4
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Not reported
Supervisor: Ajit Vaidya
Division Branch: Cleanup Sacramento

MATHER STORAGE ANX (J09CA0081) (Continued) **S107736695**

Assembly:	07
Senate:	06
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	DERA
Latitude:	38.57527
Longitude:	-121.4966
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC:	NONE SPECIFIED
Confirmed COC:	NONE SPECIFIED
Potential Description:	NONE SPECIFIED
Alias Name:	CA99799F528800
Alias Type:	Federal Facility ID
Alias Name:	J09CA0081
Alias Type:	INPR
Alias Name:	80000054
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	No Department of Defense Action Indicated (NDAI)
Completed Date:	10/30/2014
Comments:	This is a DTSC only concurrence. This determination is based on information in DTSCs and the Water Boards possession at this time concerning Department of Defense (DoD) activities on the sites listed above. DTSC and the Water Boards reserve the right to address any appropriate environmental or human health related issue, should additional information concerning the environmental condition of this site become availables in the future.
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

BA303 **SACRAMENTO ENGINEERING DEPOT** **FUDS** **1007211833**
SSW **N/A**
1/2-1 **WEST SACRAMENTO, CA**
0.706 mi.
3726 ft. **Site 1 of 2 in cluster BA**

Relative:
Higher

Actual:
32 ft.

FUDS:

Federal Facility ID:	CA9799F5842
FUDS #:	J09CA0922
INST ID:	61289
Facility Name:	SACRAMENTO ENGINEERING DEPOT
City:	WEST SACRAMENTO
State:	CA
EPA Region:	09
County:	YOLO

SACRAMENTO ENGINEERING DEPOT (Continued) **1007211833**

Congressional District:	01
US Army District:	Sacramento District (SPK)
Fiscal Year:	2012
Telephone:	916-557-7461
NPL Status:	Not Listed
RAB:	Not reported
CTC:	11
Current Owner:	Private Sector
Current Prog:	Not reported
Future Prog:	Not reported
Acreage:	Not reported
Description:	The site is located in West Sacramento, California, in Yolo County. It occupies 27.8 acres in Township 9 North, Range 4 East, M.D.B. & M. It is bounded on the west by Riske Lane and on the northwest by Ball Park Drive. South River Road forms the east and south boundaries of the site. During the site visits in 1989 and 2003, the Sacramento Engineering Depot site was occupied by numerous commercial and industrial facilities. No structures were identified to be of the definite DOD origin.
History:	In the 1942 the Army leased 27.8 acres from the Sacramento Northern Railway. The are was used by the Corps of Engineers, the former Pacific Division, as a closed storage area for the military supplies. The government constructed 18,051 square feet of shop space. Ten acres of gravel paving was added to the property. A directive dated 20 February 1945 authorized the acquisition of the property in a fee interest, in lieu of leasehold interest. At the end of the war, a military necessity was no longer required; thus the property was surplused 31 July 1947 and the lease cancelled defective 31 October 1947. Copies of the lease, a yard plans for the building and lease cancellation could not be found.
Latitude:	38.57722222000
Longitude:	-121.515

BA304 **SACRAMENTO ENGINEERING DEPOT** **CA ENVIROSTOR** **S107737186**
SSW **N/A**
1/2-1 **SACRAMENTO, CA**
0.707 mi.
3732 ft. **Site 2 of 2 in cluster BA**

Relative:
Higher

Actual:
32 ft.

ENVIROSTOR:

Facility ID:	80000700
Status:	Inactive - Needs Evaluation
Status Date:	07/01/2005
Site Code:	Not reported
Site Type:	Military Evaluation
Site Type Detailed:	FUDS
Acres:	Not reported
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Not reported
Supervisor:	Charles Ridenour
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	Not reported
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	DERA

SACRAMENTO ENGINEERING DEPOT (Continued) **S107737186**

Latitude: 38.57722
Longitude: -121.515
APN: NONE SPECIFIED
Past Use: NONE SPECIFIED
Potential COC: NONE SPECIFIED
Confirmed COC: NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: SAC ENG DEPOT
Alias Type: Alternate Name
Alias Name: CA99799F584200
Alias Type: Federal Facility ID
Alias Name: J09CA0922
Alias Type: INPR
Alias Name: 80000700
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Records Research Report (RRR)
Completed Date: 05/19/2004
Comments: DTSC agreed No Defense Action was Indicated for this site.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

BB305 **SACRAMENTO HOUSING & REDEVELOP. AGENCY** **CA HIST Cal-Sites** **S101272815**
South **1920 FRONT STREET** **N/A**
1/2-1 **SACRAMENTO, CA 95814**
0.723 mi.
3816 ft. **Site 1 of 2 in cluster BB**

Relative: Higher

Actual: 20 ft.

Calsite:
Region: SACRAMENTO
Facility ID: 34240036
Facility Type: RP
Type: RESPONSIBLE PARTY
Branch: CC
Branch Name: CENTRAL CALIFORNIA
File Name: Not reported
State Senate District: 06031994
Status: ANNUAL WORKPLAN (AWP) - ACTIVE SITE
Status Name: ANNUAL WORKPLAN - ACTIVE SITE
Lead Agency: DEPT OF TOXIC SUBSTANCES CONTROL
NPL: Not Listed
SIC Code: 24
SIC Name: MANU - LUMBER & WOOD PRODUCTS
Access: Controlled
Cortese: Not reported
Hazardous Ranking Score: Not reported
Date Site Hazard Ranked: Not reported

SACRAMENTO HOUSING & REDEVELOP. AGENCY (Continued) **S101272815**

Groundwater Contamination:	Not reported
Staff Member Responsible for Site:	DMANDEL
Supervisor Responsible for Site:	Not reported
Region Water Control Board:	CV
Region Water Control Board Name:	CENTRAL VALLEY
Lat/Long Direction:	Not reported
Lat/Long (dms):	0 0 0 / 0 0 0
Lat/long Method:	Not reported
Lat/Long Description:	Not reported
State Assembly District Code:	09
State Senate District Code:	06
Facility ID:	34240036
Activity:	ORDER
Activity Name:	I/SE, IORSE, FFA, FFSRA, VCA, EA
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	08161993
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34240036
Activity:	RA
Activity Name:	REMOVAL ACTION
AWP Code:	SOIL
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	03311997
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	358
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	X
Removal Action Certification:	N
Activity Comments:	REMOVAL AND DISPOSITION OF 358 CU. YDS OF SOIL CONTAMINATED FROM ALEAKING UNDERGROUND GASOLINE TANK. THE EXCAVATION WAS BACKFILLED WITHCLEAN PEA GRAVEL AND OXYGEN RELEASE COMPOUND.

SACRAMENTO HOUSING & REDEVELOP. AGENCY (Continued) **S101272815**

For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34240036
Activity:	CERT
Activity Name:	CERTIFICATION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	07312005
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34240036
Activity:	RAW
Activity Name:	REMOVAL ACTION WORKPLAN
AWP Code:	OFFGW
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	04272001
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34240036
Activity:	OM
Activity Name:	OPERATION & MAINTENANCE
AWP Code:	Not reported
Proposed Budget:	0

SACRAMENTO HOUSING & REDEVELOP. AGENCY (Continued) **S101272815**

AWP Completion Date:	12312030
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Alternate Address:	1920 FRONT STREET
Alternate City,St,Zip:	SACRAMENTO, CA 95814

Background Info:

The Sacramento Housing and Redevelopment Agency (SHRA) site is located at 1920 Front Street in Sacramento. The site is located adjacent to the PG&E former manufactured gas plant and encompasses the location of a former lumberyard. Contamination was found at two areas on the site. The first area was in the Southewast portion of the site. A leaking underground storage tank was removed from teh first area in 1988 and contaminated soils were removed during December 1996. The second area was located in the southwest area of the site, identified as Risk Management Zone (RMZ) VIIIa in the 1991 Remedial Action Plan (RAP). Manufactured gas plant (MGP) products from the PG&E site, located south of the site, were deposited in this zone. A Remedial Action Order (RAO) was issued on 08/16/93.
A "Soil Excavation Workplan" was finalized in August 2001. The Soil Excavation Workplan satisfied the soil removal "Design" that was specified in the May 1991 RAP. The Workplan presented the design to remove approximately 700 cubic yards of polycyclic aromatic hydrocarbons (PAHs) contaminated soil from RMZ VIIIa. Contaminated soils were removed during November 2001.
The Final Groundwater Engineering Evaluation/Cost Analysis (EE/CA) and Remedial Action Workplan (RAW) for the Front & T Street Sites, Sacramento California was completed in April 2001. The report was prepared for the Front Street Joint Defense Group (JDG) that consists of the following sites: 1) PG&E Sacramento; former MGP; 2) Cal Trans I-5, Q Street Off-ramp; 3) SHRA - 1920 Front Street; 4) SMUD - Front and T Street. The RAW implements a monitored natural attenuation (MNA) remedy combined with continued operation of the pump and treat system on the PG&E Site. A contingent remedy, which will be implemented if Site conditions change, was funded as a part of the RAW. The RAW implements the groundwater cleanup objectives for all of the Front & T Street Sites.
PG&E has accepted responsibility for monitoring and maintenance of all implemented remedies at all the Front Street JDG sites. PG&E will continue to monitor the remaining groundwater contamination via a regularly scheduled sampling and monitoring

SACRAMENTO HOUSING & REDEVELOP. AGENCY (Continued) **S101272815**

	program.
Comments Date:	03311997
Comments:	RA -- Removal and disposition of 358 cu.yds. of soil contam-
Comments Date:	03311997
Comments:	inated from a leaking underground gasoline tank. The ex-
Comments Date:	03311997
Comments:	cavation was backfilled with clean pea gravel and oxygen
Comments Date:	03311997
Comments:	release compound to enhance the bioremediation of any
Comments Date:	03311997
Comments:	remaining contaminants.
Comments Date:	04272001
Comments:	RAW - The public comment period for the Draft Final Groundwater
Comments Date:	04272001
Comments:	Engineering Evaluation/Cost Analysis (EE/CA) and Remedial Action
Comments Date:	04272001
Comments:	Work Plan (RAW) for the Front & T Street Sites, Sacramento
Comments Date:	04272001
Comments:	California for the Front Street Joint Defense Group (JDG) ended
Comments Date:	04272001
Comments:	on April 3, 2001. Department of Toxic Substances Control (DTSC)
Comments Date:	04272001
Comments:	received no comment on the above mentioned document and
Comments Date:	04272001
Comments:	therefore granted final approval for said RAW. The RAW calls
Comments Date:	04272001
Comments:	for a monitored natural attenuation (MNA) remedy combined with
Comments Date:	04272001
Comments:	continued operation of the pump and treat system on PG&E Site.
Comments Date:	04272001
Comments:	A contingent remedy, which will be implemented if Site
Comments Date:	04272001
Comments:	conditions change, is also funded as a part of this RAW.
Comments Date:	04272001
Comments:	Implementation of this RAW is designed to meet the groundwater
Comments Date:	04272001
Comments:	cleanup objectives for all of the Front & T Street Sites.
Comments Date:	04272001
Comments:	These sites include: 1) PG&E Sacramento - Former MGP 2) Cal
Comments Date:	04272001
Comments:	Trans I-5, Q Street Off-ramp 3) SHRA - 1920 Front Street and
Comments Date:	04272001
Comments:	4) SMUD - Front and T Street.
Comments Date:	12211999
Comments:	An RI Workplan was submitted by PG&E to investigate remediation
Comments Date:	12211999
Comments:	of Area VIIIA on this site.
ID Name:	CALSTARS CODE
ID Value:	100415
Alternate Name:	SACRAMENTO HOUSING & REDEVELOP. AGENCY
Special Programs Code:	Not reported
Special Programs Name:	Not reported

306
WNW
1/2-1
0.724 mi.
3825 ft.

PROPOSED K-8 FUNDAMENTAL ACADEMY
NW CORNER OF LIGHTHOUSE AND FOUNTAIN DRIVES
WEST SACRAMENTO, CA 95605

CA SCH **S107737082**
CA ENVIROSTOR **N/A**

Relative:
Higher

Actual:
21 ft.

SCH:

Facility ID:	70000067
Site Type:	School Investigation
Site Type Detail:	School
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	11.5
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Kamili Siglowide
Supervisor:	Mark Malinowski
Division Branch:	Northern California Schools & Santa Susana
Site Code:	104509
Assembly:	07
Senate:	06
Special Program Status:	Not reported
Status:	Inactive - Needs Evaluation
Status Date:	03/07/2006
Restricted Use:	NO
Funding:	School District
Latitude:	38.59587
Longitude:	-121.5154
APN:	14-630-06
Past Use:	AGRICULTURAL - ROW CROPS
Potential COC:	DDD, DDE, DDT
Confirmed COC:	30006-NO, 30007-NO, 30008-NO
Potential Description:	SOIL
Alias Name:	14-630-06
Alias Type:	APN
Alias Name:	104509
Alias Type:	Project Code (Site Code)
Alias Name:	70000067
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Workplan
Completed Date:	01/30/2006
Comments:	Received 2 copies of the Revised PEA WP, along with a CD.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Environmental Oversight Agreement
Completed Date:	10/11/2005
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Inactive Status Letter
Completed Date:	04/17/2006
Comments:	Not reported

PROPOSED K-8 FUNDAMENTAL ACADEMY (Continued) **S107737082**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 04/25/2006
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

ENVIROSTOR:
Facility ID: 70000067
Status: Inactive - Needs Evaluation
Status Date: 03/07/2006
Site Code: 104509
Site Type: School Investigation
Site Type Detailed: School
Acres: 11.5
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Kamili Siglowide
Supervisor: Mark Malinowski
Division Branch: Northern California Schools & Santa Susana
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: School District
Latitude: 38.59587
Longitude: -121.5154
APN: 14-630-06
Past Use: AGRICULTURAL - ROW CROPS
Potential COC: DDD DDE DDT
Confirmed COC: 30006-NO 30007-NO 30008-NO
Potential Description: SOIL
Alias Name: 14-630-06
Alias Type: APN
Alias Name: 104509
Alias Type: Project Code (Site Code)
Alias Name: 70000067
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Workplan
Completed Date: 01/30/2006
Comments: Received 2 copies of the Revised PEA WP, along with a CD.

PROPOSED K-8 FUNDAMENTAL ACADEMY (Continued) **S107737082**

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Environmental Oversight Agreement
Completed Date:	10/11/2005
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Inactive Status Letter
Completed Date:	04/17/2006
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Cost Recovery Closeout Memo
Completed Date:	04/25/2006
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

BB307 **SACRAMENTO HOUSING & REDEVELOP. AGENCY** **CA HIST CORTESE** **S101308025**
South **1920 FRONT STREET** **CA LUST** **N/A**
1/2-1 **SACRAMENTO, CA 95814** **CA Sacramento Co. CS**
0.727 mi. **CA DEED**
3839 ft. **Site 2 of 2 in cluster BB** **CA RESPONSE**
CA ENVIROSTOR

Relative:
Higher

Actual:
20 ft.

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	LTNKA
Reg Id:	340321
Region:	CORTESE
Facility County Code:	34
Reg By:	CALSI
Reg Id:	34240036

LUST:

Region:	STATE
Global Id:	T0606700254
Latitude:	38.573042
Longitude:	-121.510867
Case Type:	LUST Cleanup Site
Status:	Completed - Case Closed
Status Date:	04/28/2000
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Case Worker:	VJF
Local Agency:	Not reported

SACRAMENTO HOUSING & REDEVELOP. AGENCY (Continued) **S101308025**

RB Case Number: 340321
LOC Case Number: RO00000542
File Location: Not reported
Potential Media Affect: Aquifer used for drinking water supply
Potential Contaminants of Concern: Gasoline
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Contact:
Global Id: T0606700254
Contact Type: Regional Board Caseworker
Contact Name: VERA FISCHER
Organization Name: CENTRAL VALLEY RWQCB (REGION 5S)
Address: 11020 SUN CENTER DRIVE #200
City: RANCHO CORDOVA
Email: vera.fischer@waterboards.ca.gov
Phone Number: Not reported

Status History:
Global Id: T0606700254
Status: Completed - Case Closed
Status Date: 04/28/2000

Global Id: T0606700254
Status: Open - Case Begin Date
Status Date: 06/09/1988

Global Id: T0606700254
Status: Open - Site Assessment
Status Date: 06/09/1988

Regulatory Activities:
Global Id: T0606700254
Action Type: Other
Date: 06/09/1988
Action: Leak Discovery

Global Id: T0606700254
Action Type: Other
Date: 10/11/1988
Action: Leak Reported

Sacramento Co. CS:
State Site Number: RB011
Lead Staff: None assigned, H.
Lead Agency: RW
Remedial Action Taken: NO
Substance: Automotive(motor gasoline and additives)
Date Reported: 06/09/1988
Facility Id: RO0000542
Case Type: Not reported
Case Closed: Not reported
Date Closed: Not reported

SACRAMENTO HOUSING & REDEVELOP. AGENCY (Continued) **S101308025**

DEED:
Envirostor ID: 34240036
Area: PROJECT WIDE
Sub Area: Not reported
Site Type: STATE RESPONSE
Status: CERTIFIED O&M - LAND USE RESTRICTIONS ONLY
Agency: Not reported
Covenant Uploaded: Not reported
Deed Date(s): 11/07/2006

RESPONSE:
Facility ID: 34240036
Site Type: State Response
Site Type Detail: State Response or NPL
Acres: 2.2
National Priorities List: NO
Cleanup Oversight Agencies: SMBRP, RWQCB 5S - Central Valley
Lead Agency Description: DTSC - Site Cleanup Program
Project Manager: Harold (Bud) Duke
Supervisor: Jose Salcedo
Division Branch: Northern California Schools & Santa Susana
Site Code: 100415
Site Mgmt. Req.: NONE SPECIFIED
Assembly: 07
Senate: 06
Special Program Status: Not reported
Status: Certified O&M - Land Use Restrictions Only
Status Date: 08/25/2011
Restricted Use: YES
Funding: Responsible Party
Latitude: 38.57302
Longitude: -121.5108
APN: 000900120020000, 00900120020000
Past Use: FUEL - VEHICLE STORAGE/ REFUELING, MANUFACTURED GAS PLANT, MANUFACTURING - LUMBER/WOOD PRODUCTS
Potential COC : Benzene TPH-gas Ethylbenzene Polynuclear aromatic hydrocarbons (PAHs Toluene Xylenes
Confirmed COC: Benzene Polynuclear aromatic hydrocarbons (PAHs TPH-gas Ethylbenzene Toluene Xylenes
Potential Description: OTH, SOIL
Alias Name: 000900120020000
Alias Type: APN
Alias Name: 00900120020000
Alias Type: APN
Alias Name: 110033609003
Alias Type: EPA (FRS #)
Alias Name: 100415
Alias Type: Project Code (Site Code)
Alias Name: 34240036
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement
Completed Date: 10/23/2007
Comments: The O&M Agreement is complete for the site. Financial assurance will

SACRAMENTO HOUSING & REDEVELOP. AGENCY (Continued) **S101308025**

be completed shortly.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 01/21/2009
Comments: On this date DTSC concurred with the findings of the annual LUC inspection report. The site is being used in a manner consistent with the prohibitions and limitations specified in the LUC.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 02/24/2010
Comments: On this date DTSC amended the report to include a brief discussion of the Front Street Well abandonment and accepted the findings of the 2009 LUC Inspection Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 02/01/2012
Comments: The annual Land Use Covenant report was accepted as presented on this date. The report was included with reports for the three (3) other "Front & T Street sites" (CalTrans I-5 Q Street Off-ramp, PG&E - Sacramento Site and SMUD Front & T Street).

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 01/24/2011
Comments: On this date DTSC accepted the Annual Land Use Covenant Inspection Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 04/30/2008
Comments: Site Certified 4/30/8. Ongoing monitoring of groundwater will continue as needed. A land use covenant restricts some activities at the site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 08/16/1993
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction - Site Inspection/Visit
Completed Date: 10/01/2007
Comments: DTSC issued a letter which reported that the inspection revealed that the site conditions were in compliance with the LUC.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

SACRAMENTO HOUSING & REDEVELOP. AGENCY (Continued) **S101308025**

Completed Document Type:	Removal Action Workplan
Completed Date:	04/27/2001
Comments:	RAW - The public comment period for the Draft Final Groundwater Engineering Evaluation/Cost Analysis (EE/CA) and Remedial Action Work Plan (RAW) for the Front & T Street Sites, Sacramento California for the Front Street Joint Defense Group (JDG) ended on April 3, 2001. Department of Toxic Substances Control (DTSC) received no comment on the above mentioned document and therefore granted final approval for said RAW. The RAW calls for a monitored natural attenuation (MNA) remedy combined with continued operation of the pump and treat system on PG&E Site. A contingent remedy, which will be implemented if Site conditions change, is also funded as a part of this RAW. Implementation of this RAW is designed to meet the groundwater cleanup objectives for all of the Front & T Street Sites. These sites include: 1) PG&E Sacramento - Former MGP 2) Cal Trans I-5, Q Street Off-ramp 3) SHRA - 1920 Front Street and 4) SMUD - Front and T Street. Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Removal Action Completion Report
Completed Date:	03/31/1997
Comments:	RA -- Removal and disposition of 358 cu.yds. of soil contam- inated from a leaking underground gasoline tank. The ex- cavation was backfilled with clean pea gravel and oxygen release compound to enhance the bioremediation of any remaining contaminants.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Monitoring Report
Completed Date:	05/23/2007
Comments:	The draft Focused Feasibility Study was submitted on behalf of Pacific Gas and Electric Company (PG&E) for the Front and T Streets Sites. DTSC comments are scheduled to be provided by March 21, 2007.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Financial Assurance Documentation
Completed Date:	02/01/2008
Comments:	Following a review by Project and Financial Assurance Unit staff, the initial deposit of $303,648.00 was verified. Four subsequent annual payments are scheduled to be made as specified in the O&M agreement. The future payments will be adjusted as specified in the agreement.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Land Use Restriction
Completed Date:	11/07/2006
Comments:	The fully Executed Land Use Covenant was recorded on this date in Book 20061107 at page 1356.
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported

SACRAMENTO HOUSING & REDEVELOP. AGENCY (Continued) **S101308025**

Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

ENVIROSTOR:
Facility ID: 34240036
Status: Certified O&M - Land Use Restrictions Only
Status Date: 08/25/2011
Site Code: 100415
Site Type: State Response
Site Type Detailed: State Response or NPL
Acres: 2.2
NPL: NO
Regulatory Agencies: SMBRP, RWQCB 5S - Central Valley
Lead Agency: SMBRP
Program Manager: Harold (Bud) Duke
Supervisor: Jose Salcedo
Division Branch: Northern California Schools & Santa Susana
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: YES
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.57302
Longitude: -121.5108
APN: 000900120020000, 00900120020000
Past Use: FUEL - VEHICLE STORAGE/ REFUELING, MANUFACTURED GAS PLANT, MANUFACTURING - LUMBER/WOOD PRODUCTS
Potential COC: Benzene TPH-gas Ethylbenzene Polynuclear aromatic hydrocarbons (PAHs Toluene Xylenes
Confirmed COC: Benzene Polynuclear aromatic hydrocarbons (PAHs TPH-gas Ethylbenzene Toluene Xylenes
Potential Description: OTH, SOIL
Alias Name: 000900120020000
Alias Type: APN
Alias Name: 00900120020000
Alias Type: APN
Alias Name: 110033609003
Alias Type: EPA (FRS #)
Alias Name: 100415
Alias Type: Project Code (Site Code)
Alias Name: 34240036
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement
Completed Date: 10/23/2007
Comments: The O&M Agreement is complete for the site. Financial assurance will be completed shortly.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 01/21/2009

SACRAMENTO HOUSING & REDEVELOP. AGENCY (Continued) **S101308025**

Comments: On this date DTSC concurred with the findings of the annual LUC inspection report. The site is being used in a manner consistent with the prohibitions and limitations specified in the LUC.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 02/24/2010
Comments: On this date DTSC amended the report to include a brief discussion of the Front Street Well abandonment and accepted the findings of the 2009 LUC Inspection Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 02/01/2012
Comments: The annual Land Use Covenant report was accepted as presented on this date. The report was included with reports for the three (3) other "Front & T Street sites" (CalTrans I-5 Q Street Off-ramp, PG&E - Sacramento Site and SMUD Front & T Street).

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 01/24/2011
Comments: On this date DTSC accepted the Annual Land Use Covenant Inspection Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 04/30/2008
Comments: Site Certified 4/30/8. Ongoing monitoring of groundwater will continue as needed. A land use covenant restricts some activities at the site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 08/16/1993
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction - Site Inspection/Visit
Completed Date: 10/01/2007
Comments: DTSC issued a letter which reported that the inspection revealed that the site conditions were in compliance with the LUC.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 04/27/2001
Comments: RAW - The public comment period for the Draft Final Groundwater Engineering Evaluation/Cost Analysis (EE/CA) and Remedial Action Work Plan (RAW) for the Front & T Street Sites, Sacramento California for the Front Street Joint Defense Group (JDG) ended on April 3, 2001.

SACRAMENTO HOUSING & REDEVELOP. AGENCY (Continued) **S101308025**

Department of Toxic Substances Control (DTSC) received no comment on the above mentioned document and therefore granted final approval for said RAW. The RAW calls for a monitored natural attenuation (MNA) remedy combined with continued operation of the pump and treat system on PG&E Site. A contingent remedy, which will be implemented if Site conditions change, is also funded as a part of this RAW. Implementation of this RAW is designed to meet the groundwater cleanup objectives for all of the Front & T Street Sites. These sites include: 1) PG&E Sacramento - Former MGP 2) Cal Trans I-5, Q Street Off-ramp 3) SHRA - 1920 Front Street and 4) SMUD - Front and T Street.
Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 03/31/1997
Comments: RA -- Removal and disposition of 358 cu.yds. of soil contam- inated from a leaking underground gasoline tank. The ex- cavation was backfilled with clean pea gravel and oxygen release compound to enhance the bioremediation of any remaining contaminants.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/23/2007
Comments: The draft Focused Feasibility Study was submitted on behalf of Pacific Gas and Electric Company (PG&E) for the Front and T Streets Sites. DTSC comments are scheduled to be provided by March 21, 2007.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Financial Assurance Documentation
Completed Date: 02/01/2008
Comments: Following a review by Project and Financial Assurance Unit staff, the initial deposit of $303,648.00 was verified. Four subsequent annual payments are scheduled to be made as specified in the O&M agreement. The future payments will be adjusted as specified in the agreement.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 11/07/2006
Comments: The fully Executed Land Use Covenant was recorded on this date in Book 20061107 at page 1356.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

308
SE
1/2-1
0.736 mi.
3884 ft.

MCCURRY COMPANIES
1231 K ST
SACRAMENTO, CA 95814

CA ENVIROSTOR **S101481812**
N/A

Relative:
Higher

Actual:
24 ft.

ENVIROSTOR:

Facility ID:	34590018
Status:	No Further Action
Status Date:	11/08/1994
Site Code:	Not reported
Site Type:	Historical
Site Type Detailed:	* Historical
Acres:	Not reported
NPL:	NO
Regulatory Agencies:	NONE SPECIFIED
Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	Not reported
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not reported
Latitude:	38.57833
Longitude:	-121.4905
APN:	NONE SPECIFIED
Past Use:	NONE
Potential COC:	NONE SPECIFIED No Contaminants found
Confirmed COC:	No Contaminants found
Potential Description:	NMA
Alias Name:	34590018
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Screening
Completed Date:	03/09/1987
Comments:	SITE SCREENING DONE NEED MORE INFO
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

309
WSW
1/2-1
0.758 mi.
4001 ft.

H&H CLEANERS — **CA SLIC** **S100190982**
1231 MERKLEY AVE — **CA ENVIROSTOR** **N/A**
WEST SACRAMENTO, CA 95799

Relative:
Higher

Actual:
23 ft.

SLIC:

Region:	STATE
Facility Status:	**Open - Site Assessment**
Status Date:	05/30/2013
Global Id:	T10000004774
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	Not reported
Latitude:	38.5797874410266
Longitude:	-121.523364608459
Case Type:	Cleanup Program Site
Case Worker:	AST
Local Agency:	Not reported
RB Case Number:	Not reported
File Location:	Regional Board
Potential Media Affected:	Not reported
Potential Contaminants of Concern:	Tetrachloroethylene (PCE), Trichloroethylene (TCE)
Site History:	A dry cleaner operated at this site between about 1962 and about 1995. Not reported

Click here to access the California GeoTracker records for this facility:

ENVIROSTOR:

Facility ID:	57720007
Status:	Refer: Other Agency
Status Date:	11/16/1994
Site Code:	Not reported
Site Type:	Historical
Site Type Detailed:	* Historical
Acres:	Not reported
NPL:	NO
Regulatory Agencies:	NONE SPECIFIED
Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	Referred - Not Assigned
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not reported
Latitude:	38.57918
Longitude:	-121.5239
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC:	NONE SPECIFIED
Confirmed COC:	NONE SPECIFIED
Potential Description:	NONE SPECIFIED
Alias Name:	57720007
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	Not reported

H&H CLEANERS (Continued) **S100190982**

Completed Sub Area Name: Not reported
Completed Document Type: Not reported
Completed Date: Not reported
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

310
SE
1/2-1
0.760 mi.
4013 ft.

CALTRANS HEADQUARTERS **CA FID UST** **S101628216**
1120 N ST **CA SWEEPS UST** **N/A**
SACRAMENTO, CA 95814 **CA HWP**

Relative:
Higher

Actual:
22 ft.

CA FID UST:
Facility ID: 34002461
Regulated By: UTNKA
Regulated ID: 00068140
Cortese Code: Not reported
SIC Code: Not reported
Facility Phone: Not reported
Mail To: Not reported
Mailing Address: Not reported
Mailing Address 2: Not reported
Mailing City,St,Zip: SACRAMENTO 95814
Contact: Not reported
Contact Phone: Not reported
DUNs Number: Not reported
NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Active

SWEEPS UST:
Status: Active
Comp Number: 68140
Number: 6
Board Of Equalization: 44-019586
Referral Date: 10-20-92
Action Date: 10-26-93
Created Date: 02-29-88
Owner Tank Id: 1
SWRCB Tank Id: 34-000-068140-000001
Tank Status: A
Capacity: 1000
Active Date: 10-20-92
Tank Use: M.V. FUEL
STG: P
Content: REG UNLEADED
Number Of Tanks: 2

CALTRANS HEADQUARTERS (Continued) **S101628216**

Status:	Active
Comp Number:	68140
Number:	6
Board Of Equalization:	44-019586
Referral Date:	10-20-92
Action Date:	10-26-93
Created Date:	02-29-88
Owner Tank Id:	2
SWRCB Tank Id:	34-000-068140-000002
Tank Status:	A
Capacity:	1000
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	DIESEL
Number Of Tanks:	Not reported

HWP:

EPA Id:	CAD981685563
Cleanup Status:	NON-OPERATING
Latitude:	Not reported
Longitude:	Not reported
Facility Type:	Historical - Non-Operating
Facility Size:	Not reported
Team:	Not reported
Supervisor:	Not reported
Site Code:	Not reported
Assembly District:	Not reported
Senate District:	Not reported
Public Information Officer:	Not reported

311
SW
1/2-1
0.764 mi.
4034 ft.

RICE GROWERS ASSOCIATION **CA EMI** **S106838236**
901 SOUTH RIVER ROAD **CA ENVIROSTOR** **N/A**
WEST SACRAMENTO, CA 95691

Relative:
Higher

Actual:
29 ft.

EMI:

Year:	1987
County Code:	57
Air Basin:	SV
Facility ID:	8
Air District Name:	YS
SIC Code:	2044
Air District Name:	YOLO/SOLANO AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	1
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	121
Part. Matter 10 Micrometers & Smllr Tons/Yr:	37

ENVIROSTOR:

Facility ID:	57200005

RICE GROWERS ASSOCIATION (Continued) **S106838236**

Status: No Further Action
Status Date: 12/27/1990
Site Code: 100261
Site Type: Historical
Site Type Detailed: * Historical
Acres: Not reported
NPL: NO
Regulatory Agencies: NONE SPECIFIED
Lead Agency: NONE SPECIFIED
Program Manager: Not reported
Supervisor: Not reported
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Not reported
Latitude: 38.57587
Longitude: -121.5166
APN: NONE SPECIFIED
Past Use: LANDFILL - HAZARDOUS WASTE
Potential COC: Aluminum phosphide
Confirmed COC: Aluminum phosphide
Potential Description: SOIL
Alias Name: 110021145134
Alias Type: EPA (FRS #)
Alias Name: 100261
Alias Type: Project Code (Site Code)
Alias Name: 57200005
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 12/27/1990
Comments: SITE SCREENING DONE RECOMMEND NO FURTHER ACTION REQUIRED AT PHOSTOXIN BURIAL SITE.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment Report
Completed Date: 11/29/1990
Comments: PRELIM ASSESS DONE PRELIMINARY ENDANGERMENT ASSESSMENT REPORT SUBMITTED. SOIL REMOVAL CONDUCTED 4/24/90. SAMPLE RESULTS INDICATE ALL POINTS BELOW DETECTION LIMIT AT .1 PPB. RISK ASSESSMENT CONCLUDES DETECTION LIMIT IS BELOW HEALTH PROTECTIVE LEVEL.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 03/11/1988
Comments: SITE SCREENING DONE SCREENING DONE; RECOMMEND PRELIMINARY ASSESSMENT.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report

RICE GROWERS ASSOCIATION (Continued) **S106838236**

Completed Date: 11/26/1990
Comments: Uploaded historical PEA Report, NFA Recommended

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

312
WSW
1/2-1
0.808 mi.
4264 ft.

TOMLIN'S SUNSHINE CLEANERS **CA ENVIROSTOR** **S101482951**
612 MICHIGAN BLVD **N/A**
WEST SACRAMENTO, CA 95691

Relative:
Higher

Actual:
23 ft.

ENVIROSTOR:
Facility ID: 57720004
Status: Refer: Other Agency
Status Date: 11/16/1994
Site Code: Not reported
Site Type: Historical
Site Type Detailed: * Historical
Acres: Not reported
NPL: NO
Regulatory Agencies: NONE SPECIFIED
Lead Agency: NONE SPECIFIED
Program Manager: Not reported
Supervisor: Referred - Not Assigned
Division Branch: Cleanup Sacramento
Assembly: Not reported
Senate: 06
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Not reported
Latitude: 0
Longitude: 0
APN: NONE SPECIFIED
Past Use: NONE SPECIFIED
Potential COC: NONE SPECIFIED
Confirmed COC: NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: 57720004
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: Not reported
Completed Sub Area Name: Not reported
Completed Document Type: Not reported
Completed Date: Not reported
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported

TOMLIN'S SUNSHINE CLEANERS (Continued) **S101482951**

Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

BC313 **PG&E - SACRAMENTO SITE** **CA BOND EXP. PLAN** **S100833174**
South **2000 FRONT STREET** **CA Cortese** **N/A**
1/2-1 **SACRAMENTO, CA 95818** **CA HIST CORTESE**
0.834 mi. **CA SLIC**
4401 ft. **Site 1 of 4 in cluster BC** **CA DEED**
CA Sacramento Co. ML
Relative: **CA RESPONSE**
Higher **CA ENVIROSTOR**

Actual: **26 ft.**

CA BOND EXP. PLAN:
Reponsible Party: RESPONSIBLE PARTY-LEAD SITE CLEANUP WORKPLAN
Project Revenue Source Company: Not reported
Project Revenue Source Addr: Not reported
Project Revenue Source City,St,Zip: Not reported
Project Revenue Source Desc: It is expected that Pacific Gas and Electric Company will fund the site characterization and remedial action. DHS entered into an enforceable agreement with the responsible parties. DHS has budgeted $100,000 for oversight/monitoring of cleanup efforts. DHS will recover 100 percent of direct costs plus staff costs and overhead related to the project. The responsible parties will pay all costs associated with remedial investigations and cleanup activities.
Site Description: A former "City Gas Plant" or coal and crude oil gasification facility was located at this site. The former facility manufactured gas from coal and later used crude oil as a raw material.
Hazardous Waste Desc: Coal gasification facilities typically generated "coal tar" or "lamp black" residues. These residues contained compounds known as either Polynuclear Aromatic Hydrocarbons (PNA) or Polycyclic Aromatic Hydrocarbons (PAHs). These wastes were either sold for recycling purposes or used to fill in depressions or ponds and then covered or paved over with the wastes left in place.
Threat To Public Health & Env: The site is currently fenced and locked; access onto the site is controlled by PG&E. All exposed contaminant deposits have been paved to control migration and exposure. The avenues of exposure are ingestion of contaminated ground water and inhalation of contaminated dust or direct contact with contaminated soils. Presently, inadvertent exposure is not probable since the contaminated shallow ground water is not used for domestic purposes. Exposure to contaminated soil would only occur if the asphaltic cap were disturbed during construction onsite.
Site Activity Status: Pacific Gas and Electric Company has informed DHS that it is investigating a number of sites to determine if PNAs are present. PG&E has completed a major portion of the field work for the Remedial Investigation of the Sacramento site. The Feasibility Study Report is being prepared which will evaluate remedial alternatives.

CORTESE:
Region: CORTESE
Envirostor Id: 34490048
Site/Facility Type: STATE RESPONSE
Cleanup Status: ACTIVE - LAND USE RESTRICTIONS
Status Date: 01/01/1987
Site Code: 100160

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Latitude:	38.572192
Longitude:	-121.51142
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	envirostor
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported

HIST CORTESE:

Region:	CORTESE
Facility County Code:	34
Reg By:	CALSI
Reg Id:	34490048

SLIC:

Region:	STATE
Facility Status:	**Open - Remediation**
Status Date:	09/02/2012
Global Id:	SL205112995
Lead Agency:	CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number:	34490048
Latitude:	38.5721956
Longitude:	-121.5103594
Case Type:	Cleanup Program Site
Case Worker:	WLB
Local Agency:	DEPARTMENT OF TOXIC SUBSTANCES CONTROL
RB Case Number:	Not reported
File Location:	Regional Board
Potential Media Affected:	Not reported
Potential Contaminants of Concern:	Not reported
Site History:	Former PG&E manufactured gas plant. Soil stabilization/solidification has been selected as the remedial action. DTSC lead site.

Click here to access the California GeoTracker records for this facility:

SLIC REG 5:

Region:	5
Facility Status:	Remediation Underway
Unit:	Facility is a Spill or site
Pollutant:	TPH, BTEX, PAH
Lead Agency:	Not reported
Date Filed:	07/27/01
Report Date:	06/01/01
Date Added:	Not reported
Date Closed:	Not reported

DEED:

Envirostor ID:	34490048
Area:	PROJECT WIDE

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Sub Area: Not reported
Site Type: STATE RESPONSE
Status: ACTIVE
Agency: Not reported
Covenant Uploaded: Not reported
Deed Date(s): 05/19/1993

Sacramento Co. ML:
Facility Id: Not reported
Facility Status: Not reported
FD: Not reported
Billing Codes BP: I
Billing Codes UST: Not reported
WG Bill Code: I
Target Property Bill Cod: Not reported
Food Bill Code: Not reported
CUPA Permit Date: Not reported
HAZMAT Permit Date: Not reported
HAZMAT Inspection Date: Not reported
Hazmat Date BP Received: Not reported
UST Permit Dt: Not reported
UST Inspection Date: Not reported
UST Tank Test Date: Not reported
Number of Tanks: Not reported
UST Tank Test Date: Not reported
SIC Code: Not reported
Tier Permitting: Not reported
AST Bill Code: Not reported
CALARP Bill Code: Not reported

RESPONSE:
Facility ID: 34490048
Site Type: State Response
Site Type Detail: State Response or NPL
Acres: 6.4
National Priorities List: NO
Cleanup Oversight Agencies: SMBRP, RWQCB 5S - Central Valley
Lead Agency Description: DTSC - Site Cleanup Program
Project Manager: Harold (Bud) Duke
Supervisor: Jose Salcedo
Division Branch: Northern California Schools & Santa Susana
Site Code: 100160
Site Mgmt. Req.: REM, ASP, DAY, LUC, NOWN, NUSE, NDEV, SCH, RES
Assembly: 07
Senate: 06
Special Program Status: Not reported
Status: Active
Status Date: 01/01/1987
Restricted Use: YES
Funding: Responsible Party
Latitude: 38.57219
Longitude: -121.5114
APN: 009-0012-003, 00900120030000
Past Use: MANUFACTURED GAS PLANT
Potential COC : Benzene Polynuclear aromatic hydrocarbons (PAHs Ethylbenzene Toluene Xylenes

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Confirmed COC:	Benzene Polynuclear aromatic hydrocarbons (PAHs Ethylbenzene Toluene Xylenes
Potential Description:	OTH, SOIL
Alias Name:	PACIFIC GAS & ELECTRIC - SACRAMENTO
Alias Type:	Alternate Name
Alias Name:	PG&E MANUFACTURED GAS PLANT SV-SA-SAC-1
Alias Type:	Alternate Name
Alias Name:	009-0012-003
Alias Type:	APN
Alias Name:	00900120030000
Alias Type:	APN
Alias Name:	CAD981415557
Alias Type:	EPA Identification Number
Alias Name:	110033610876
Alias Type:	EPA (FRS #)
Alias Name:	SL205112995
Alias Type:	GeoTracker Global ID
Alias Name:	P12143
Alias Type:	PCode
Alias Name:	100160
Alias Type:	Project Code (Site Code)
Alias Name:	34490048
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Correspondence
Completed Date:	09/16/2013
Comments:	DTSC PM change from Sam Martinez to Mary Gaspari. On Sept. 16, 2013, Sam sent an email informing everyone about the DTSC PM change. The official letter was mailed out on 9/18/2013.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Design/Implementation Workplan
Completed Date:	10/15/2012
Comments:	On This date, DTSC approved the Design & Implementation plan. The final version is dated October 5, 2012 with revised drawings dated October 10, 2012.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Action Implementation Workplan
Completed Date:	09/12/2012
Comments:	On this date, DTSC completed the formal review of a proposal to modify the remedial action for the subsurface soil. Rather than perform solidification and stabilization, the soil requiring treatment would only be solidified using Portland cement. DTSC also authorized the use of mixing using excavation equipment (bucket mixing). The treated material must comply with all other specifications in the RDIP.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Financial Assurance Documentation
Completed Date:	08/29/2013
Comments:	Completed by FA Unit 8/29/2013

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 11/17/2014
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Financial Assurance Documentation
Completed Date: 06/10/2014
Comments: DTSC issued its Financial Assurance review findings for the PG&E Sacramento Front St site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 01/21/2009
Comments: On this date DTSC concurred with the findings of the annual LUC inspection report. The site is being used in a manner consistent with the prohibitions and limitations specified in the LUC.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction - Site Inspection/Visit
Completed Date: 10/01/2007
Comments: DTSC issued a letter which reported that the inspection revealed that the site conditions were in compliance with the LUC.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 02/24/2010
Comments: On this date DTSC amended the report to include a brief discussion of the Front Street Well abandonment and accepted the findings of the 2009 LUC Inspection Report, as amended.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 02/09/1987
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 08/24/2005
Comments: Workplan approved per letter dated 8/24/2005.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Pilot Study/Treatability Workplan
Completed Date: 12/11/2006
Comments: This study was submitted 20 days later than expected.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Date: 05/23/2007
Comments: The draft Focused Feasibility Study was submitted on behalf of Pacific Gas and Electric Company (PG&E) for the Front and T Streets Sites. DTSC comments are scheduled to be provided by March 21, 2007.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operations and Maintenance Manual
Completed Date: 08/10/2007
Comments: DTSC transmitted comments on the draft plan and requested a revised plan be submitted on March 30, 2007.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operations and Maintenance Manual
Completed Date: 08/07/2007
Comments: DTSC provided comments and direction for the revision of the Cap Plan. Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Well Decommissioning Workplan
Completed Date: 05/16/2007
Comments: The Soil Vapor Extraction and Treatment System (SVETS) was constructed in 1999 to address contaminants present beneath the CalTrans and SMUD parcels. The evaluation presented indicates that the SVETS has had a minimal effect on the remediation and is not performing as expected. The concentrations of the contaminants of concern detected in samples collected in 2005 are roughly equivalent to those detected in 1999. The proposal recommends the removal of the SVETS as it is not effective in attaining the goals set forth in the Remedial Action Objectives set forth in either the Remedial Action Plan (RAP) or the Final Groundwater Engineering Evaluation/Cost Analysis and Remedial Action Workplan (EE/CA RAW). DTSC concurred with the proposal to decommission the SVETS and requested notification of the commencement of decommissioning and any deviation or modification from this proposal.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Plan
Completed Date: 12/13/2007
Comments: The SAP dated 11/16/7 which was submitted on of PG&E by ARCADIS was approved by DTSC. DTSC reviewed all portions of the document but did not review Appendix E, which is the current Health and Safety Plan, DTSC staff inspecting the Site will be familiar with applicable safety rules and procedures, DTSC does not offer approval of Health and Safety Plans.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 05/09/2007
Comments: DTSC reviewed the reported and concurred with the findings and recommendations.

Completed Area Name: PROJECT WIDE

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Sub Area Name: Not reported
Completed Document Type: Financial Assurance Documentation
Completed Date: 02/01/2008
Comments: Following a review by Project and Financial Assurance Unit staff, the initial deposit of $303,648.00 was verified. Four subsequent annual payments are scheduled to be made as specified in the O&M agreement. The future payments will be adjusted as specified in the agreement.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Implementation Workplan
Completed Date: 04/11/2008
Comments: On this date DTSC approved the subject work plan which describes the work proposed to collect analytical samples as well as media for use in potential bench-scale tests. The results of this investigation will be the basis for consideration of a remedial system enhancement. The objective of this work is to yield data for use in identifying a remedial technology that will more effectively reduce toxicity, mobility, volume, and time to remedy site than the current remedy.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 10/29/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 04/05/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 04/29/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 07/21/2011
Comments: On this date, DTSC determined that the report adequately reflects the work completed duting April, May and June of 2011.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 11/22/2011
Comments: On this date, DTSC determined that the report adequately reflects the work completed during July, August and September of 2011.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 02/03/2012
Comments: On this date, DTSC presented findings of the review of the Fourth

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Quarter 2011 Summary Report. DTSC found that in general, the report adequately summarizes the recent progress. DTSC did note that the Third Quarter 2011 Summary Report was submitted to DTSC on October 27, 2011, not on October 18th as stated in the Fourth Quarter Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 07/15/2014
Comments: DTSC approved the First Quarter 2014 Summary Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 10/16/2014
Comments: DTSC issued its approval of the 2nd Quarter 2014 Quarterly Monitoring Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Treatability Study Report
Completed Date: 06/08/2010
Comments: The Treatability Study concludes that an admixture of 10% Portland cement and 4% granulated activated carbon will achieve the criteria set forth in the study. The study did not evaluate the contaminant capture over a range of mixtures. This is a data gap that will have to be addressed during the design phase should this remedy be selected for use at the site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 01/15/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 03/02/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 04/15/2011
Comments: On this date, DTSC accepted the report as written no revision was requested.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 03/20/2012
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Date: 07/16/2014
Comments: DTSC issued its approval of the 2013 Annual Groundwater Monitoring Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 03/15/2010
Comments: On this date DTSC accepted the data presented in the report which was presented in the refined Conceptual Site Model.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 09/02/2010
Comments: On this date, DTSC accepted the additional sampling and results as presented in the report dated August 13, 2010.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operations and Maintenance Manual
Completed Date: 09/22/2010
Comments: On this date the Operation, Maintenance & Monitoring Manual for the GWETS that was rehabilitated/relocated this year. This manual replaces the manual specified in paragraph 2.1.1 of the Operation & Maintenance Agreement.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan Amendment
Completed Date: 04/27/2011
Comments: DTSC approved the draft RAP for release on this date. The public comment period for the Draft RAP will commence on April 29, 2011 and will end on May 31, 2011. Fact sheets were mailed for delivery on the 29th and a public notice will be published on the 29th as well. A public meeting is scheduled for May 18 at the Towe Auto Museum in Sacramento. The Draft RAP proposes in-situ soil stabilization/solidification by the addition of Portland Cement and Activated carbon to the areas where the highest contamination is found in the vadose zone. The currently operating Groundwater remedy will continue to operate until RAOs are achieved. Modification of the remedy is necessary as the Ranney Collector, a nearby large volume well was decommissioned in 2009 and the contingent remedy was implemented.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Community Profile
Completed Date: 11/18/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 04/21/2011
Comments: Not reported

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fact Sheets
Completed Date: 04/26/2011
Comments: Fact Sheet will be placed on the Community Involvement page.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Treatability Study Workplan
Completed Date: 03/09/2011
Comments: On this date, DTSC approved the plan to collect further samples for testing to evaluate the usage of granulated activated carbon and powdered activated carbon.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Soils Management Plan
Completed Date: 05/18/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 06/30/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Design - Preliminary/Intermediate
Completed Date: 03/13/2012
Comments: On this date, DTSC conditionally approved the RDIP. Twelve conditions which addressed everything from compliance with mitigation measures, monitoring wells and required plans were addressed. The conditional approval was granted in an effort to allow the preliminary construction activities to occur, while final approvals are obtained from other agencies.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Mitigation Monitoring Report
Completed Date: 09/07/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 08/18/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Treatability Study Report
Completed Date: 01/20/2012
Comments: On this date, DTSC accepted the proposal to utilize a 10% Portland Cement and 3% Regen GAC or GAC formulation during the implementation of the remedy selected in the RAP.

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment Report
Completed Date: 05/05/1987
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 04/10/2012
Comments: Survey was mailed by PG&E to the appropriate personnel at the Department of Fish & Game.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 06/30/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 02/01/2012
Comments: The annual Land Use Covenant report was accepted as presented on this date. The report was included with reports for the three (3) other "Front & T Street sites" (Caltrans I-5 Q Street Off-ramp, Sacramento Housing and Redevelopment Agency and SMUD Front & T Street).

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 07/16/2014
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement
Completed Date: 10/23/2007
Comments: The O&M Agreement is complete for the site. Financial assurance will be completed shortly.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 01/24/2011
Comments: On this date DTSC accepted the Annual Land Use Covenant Inspection Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Litigation Support
Completed Date: 03/08/2013
Comments: On this date this task was completed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Date: 05/19/1993
Comments: Restrictions include no human habitation including residences hospitals, schools for persons under age 21, day-care centers, hotels, motels, or residences for employees. Property owner must maintain integrity of the cap that was placed pursuant to the Remedial Action Plan for the site. This is the Date that the Deed Restriction was recorded in the official records of Sacramento County in Book 93 0519 at Page 1332.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consent Order
Completed Date: 03/30/1988
Comments: Enforceable Agreement H&SC 2535505(a)(1)(C), 205 and 205. The order required limiting access completing an in progress RI/FS, preparation of a RAP and implementation of the RAP.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 02/09/1987
Comments: Responsible Party Preliminary Assessment conducted, reported to DHS. Sample results: Lead = 3000ppm, PNA = 500ppm. Site Screening Done: No documented clean-up.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 06/20/2014
Comments: DTSC issued a letter outlining unbilled outstanding costs incurred by PG&E between 1989 and 1999.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 12/19/2002
Comments: DES- The Soil Excavation Workplan is the soil removal "Design" that was specified in the May 1991 RAP. The Workplan presents the design to remove approximately 700 Cubic yards of polycyclic aromatic hydrocarbons (PAHs) contaminated soil from Sacramento Housing and Redevelopment Agency (SHRA) property that borders the original PG&E manufactured gas plant.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 12/19/2002
Comments: RMDL/SHRA -- The satisfactory removal of all contaminated soil from the Sacramento Housing and Redevelopment Agency (SHRA) property as specified in the May 1991 Final Remedial Action Plan (RAP) for the Former Sacramento Manufactured Gas Plant Site. Approximately 1200 cubic yards of polycyclic aromatic hydrocarbons (PAHs) contaminated soil from the SHRA property that borders the original PG&E manufactured gas plant.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Document Type: Removal Action Workplan
Completed Date: 04/27/2001
Comments: RAW- The public comment period for the Draft Final Groundwater Engineering Evaluation/Cost Analysis (EE/CA) and Remedial Action Work Plan (RAW) for the Front & T Street Sites, Sacramento CA for the Front Street Joint Defense Group (JDG) ended on April 3, 2001 DTSC received no comment on the above mentioned document and therefore granted final approval for said RAW. The RAW calls for a monitored natural attenuation (MNA) remedy combined with continued operation of the pump and treat system on PG&E Site. A contingent remedy, which will be implemented if Site conditions change, is also funded as a part of this RAW. Implementation of this RAW is designed to meet the groundwater cleanup objectives for all of the Front & T Street Sites. These Sites include: 1) PG&E Sacramento - Former MGP 2) CalTrans I-5, Q Street Offramp 3) SHRA - 1920 Front Street and 4) SMUD - Front and T Street.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedy Constructed: Operating Properly & Successfully
Completed Date: 06/28/1996
Comments: RMDL (GW1) Groundwater treatment plant for the site went online 8/25/95. The system includes 4 extraction wells, 4 reinjection wells, 3 observational piezometers and a carbon filter treatment plant. Groundwater Remediation Extraction Rate (gpd): up to 115,200 gal per day.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 01/18/1996
Comments: From a Report of Completion Annual Workplan Activities dated 11/8/95: "IN COMPLIANCE WITH MAY 1991 RAP FOR THIS SITE, SOIL REMEDIATION WAS COMPLETED ON 8/18/95 WITH THE FINAL PLACEMENT OF AN ENGINEERED SITE CAP AND FENCING OF THE SITE PERIMETER. THE ENGINEERED CAP WILL BE MAINTAINED UNDER AN O&M AGREEMENT WHICH IS EXPECTED TO BE FINALIZED IN THE FIRST QUARTER OF 1996.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 05/16/1995
Comments: The extraction and treatment system for the onsite portion of the plume was approved. The system will consist of 4 extraction wells placed along the perimeter in the NE corner of the Site. After extraction, GW will be treated with GAC, followed by disposal of POTW. Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 09/03/1992
Comments: The RP proposed a revised construction alternative for the final site cap, the document entitled " Ground Water Remedial Action Plan for the Sacramento Former Manufactured Gas Plant Site. The approval is found in the fourth paragraph of the September 3, 1992 letter to PG&E captioned"Comments on Ground Water Design Report Pacific Gas and

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Electric, Sacramento County."

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 12/04/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 04/30/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 12/31/1990
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 01/30/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 05/15/2012
Comments: On this date, (please note that the date of the letter was incorrect on the first page and correct on subsequent pages) DTSC conditionally approved the use of the alternate facility. The conditions were: 1) PG&E is responsible for the accuracy and completeness of the waste profile of the GCL; 2) PG&E is responsible for insuring that the transport of the material complies with the specifications presented in the RDIP; 3)In the event that the GCL is rejected upon arrival at Forward Landfill, PG&E is responsible for returning the GCL to the site and for the proper storage of the GCL until an alternate facility can be identified; and 4) PG&E is responsible for insuring that the transport of the GCL to Manteca is documented in the Green Remediation Evaluation which is included in the final report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 09/08/2009
Comments: On this date, DTSC issued a letter of formally acceptance of the Revised Supplemental Soil Investigation report dated Sept. 1, 2009 as meeting the objectives set forth in the work plan for the investigation.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Soils Management Plan
Completed Date: 08/04/2008
Comments: On this date DTSC approved the plan that describes the excavation an

PG&E - SACRAMENTO SITE (Continued) **S100833174**

soil emplacement required to perform a legally required visual inspection of the pipe.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 09/03/2008
Comments: In a letter dated September 3, 2008 DTSC recieved a request for additional sampling to better meet the objectives presented in the Final Supplemental Soil Investigation Work Plan (Plan) dated March 28, 2008. Given that the collection of additional samples and data will refine the knowledge of the characteristics and volume of soil that requires further remediation, the additional work is hereby approved and incorporated into the Final Supplemental Soil Investigation Work Plan (Plan) dated March 28, 2008. The March 28 Plan was prepared for the Front & T Street Sites, Sacramento, California by ARCADIS for the Pacific Gas and Electric Company (PG&E).
Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Soils Management Plan
Completed Date: 01/12/2009
Comments: On this date DTSC issued a letter to PG&E accepting the first draft as complete.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Treatability Study Workplan
Completed Date: 07/22/2009
Comments: On this date, DTSC approved the Treatability Study Plan for the in-situ soil stabilization/solidification. The objective of the study is to determine the proper stabilization mixture that will achieve the following: Permeability equal to, or less than, 1 x 10-6 centimeters per second; Unconfined compressive strength equal to or greater than, 30 pounds per square inch; and Reduce leaching of contaminants to groundwater to concentrations below target criteria. Additionally, the study will qualitatively examine vapor generation, temperature increase during treatment, and encapsulation of non-aqueous phase liquids.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Workplan
Completed Date: 07/29/2009
Comments: On this date, DTSC approved the "Revised Soil Vapor Assessment Plan dated July 7, 2009. The data generated will be incorporated into the CSM for further evaluation of whether or not remedial action is appropriate for this pathway.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 11/04/2009
Comments: The RAOs proposal will be revised and presented in a future document. The document will reflect the selection of the alternative remedy and the refinement of the RAOs to reflect that remedy.

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 12/09/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan Amendment
Completed Date: 01/04/2010
Comments: On July 29, 2009, DTSC requested that PG&E undertake examination of the remedy and evaluate the need for modification or enhancement. On September 11, 2209 the evaluation was presented with a recommendation that the currently operating GWETS be replaced. Rather than shut down the operating system, a replacement will be constructed on-site and placed in operation before the old system is decommissioned. This course of action was approved on this date.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Design - Preliminary/Intermediate
Completed Date: 11/04/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 01/25/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 04/22/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 08/12/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction - Site Inspection/Visit
Completed Date: 11/13/2014
Comments: Not reported

Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: Certification
Future Due Date: 2017
Future Area Name: PROJECT WIDE
Future Sub Area Name: Not reported
Future Document Type: 5 Year Review Reports
Future Due Date: 2019
Schedule Area Name: Not reported

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

ENVIROSTOR:
Facility ID: 34490048
Status: Active
Status Date: 01/01/1987
Site Code: 100160
Site Type: State Response
Site Type Detailed: State Response or NPL
Acres: 6.4
NPL: NO
Regulatory Agencies: SMBRP, RWQCB 5S - Central Valley
Lead Agency: SMBRP
Program Manager: Harold (Bud) Duke
Supervisor: Jose Salcedo
Division Branch: Northern California Schools & Santa Susana
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: YES
Site Mgmt Req: REM, ASP, DAY, LUC, NOWN, NUSE, NDEV, SCH, RES
Funding: Responsible Party
Latitude: 38.57219
Longitude: -121.5114
APN: 009-0012-003, 00900120030000
Past Use: MANUFACTURED GAS PLANT
Potential COC: Benzene Polynuclear aromatic hydrocarbons (PAHs Ethylbenzene Toluene Xylenes
Confirmed COC: Benzene Polynuclear aromatic hydrocarbons (PAHs Ethylbenzene Toluene Xylenes
Potential Description: OTH, SOIL
Alias Name: PACIFIC GAS & ELECTRIC - SACRAMENTO
Alias Type: Alternate Name
Alias Name: PG&E MANUFACTURED GAS PLANT SV-SA-SAC-1
Alias Type: Alternate Name
Alias Name: 009-0012-003
Alias Type: APN
Alias Name: 00900120030000
Alias Type: APN
Alias Name: CAD981415557
Alias Type: EPA Identification Number
Alias Name: 110033610876
Alias Type: EPA (FRS #)
Alias Name: SL205112995
Alias Type: GeoTracker Global ID
Alias Name: P12143
Alias Type: PCode
Alias Name: 100160
Alias Type: Project Code (Site Code)
Alias Name: 34490048
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 09/16/2013
Comments: DTSC PM change from Sam Martinez to Mary Gaspari. On Sept. 16, 2013, Sam sent an email informing everyone about the DTSC PM change. The official letter was mailed out on 9/18/2013.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 10/15/2012
Comments: On This date, DTSC approved the Design & Implementation plan. The final version is dated October 5, 2012 with revised drawings dated October 10, 2012.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Implementation Workplan
Completed Date: 09/12/2012
Comments: On this date, DTSC completed the formal review of a proposal to modify the remedial action for the subsurface soil. Rather than perform solidification and stabilization, the soil requiring treatment would only be solidified using Portland cement. DTSC also authorized the use of mixing using excavation equipment (bucket mixing). The treated material must comply with all other specifications in the RDIP.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Financial Assurance Documentation
Completed Date: 08/29/2013
Comments: Completed by FA Unit 8/29/2013

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 11/17/2014
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Financial Assurance Documentation
Completed Date: 06/10/2014
Comments: DTSC issued its Financial Assurance review findings for the PG&E Sacramento Front St site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 01/21/2009
Comments: On this date DTSC concurred with the findings of the annual LUC inspection report. The site is being used in a manner consistent with the prohibitions and limitations specified in the LUC.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction - Site Inspection/Visit

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Date: 10/01/2007
Comments: DTSC issued a letter which reported that the inspection revealed that the site conditions were in compliance with the LUC.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 02/24/2010
Comments: On this date DTSC amended the report to include a brief discussion of the Front Street Well abandonment and accepted the findings of the 2009 LUC Inspection Report, as amended.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 02/09/1987
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 08/24/2005
Comments: Workplan approved per letter dated 8/24/2005.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Pilot Study/Treatability Workplan
Completed Date: 12/11/2006
Comments: This study was submitted 20 days later than expected.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/23/2007
Comments: The draft Focused Feasibility Study was submitted on behalf of Pacific Gas and Electric Company (PG&E) for the Front and T Streets Sites. DTSC comments are scheduled to be provided by March 21, 2007.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operations and Maintenance Manual
Completed Date: 08/10/2007
Comments: DTSC transmitted comments on the draft plan and requested a revised plan be submitted on March 30, 2007.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operations and Maintenance Manual
Completed Date: 08/07/2007
Comments: DTSC provided comments and direction for the revision of the Cap Plan. Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Well Decommissioning Workplan
Completed Date: 05/16/2007
Comments: The Soil Vapor Extraction and Treatment System (SVETS) was

PG&E - SACRAMENTO SITE (Continued) **S100833174**

constructed in 1999 to address contaminants present beneath the CalTrans and SMUD parcels. The evaluation presented indicates that the SVETS has had a minimal effect on the remediation and is not performing as expected. The concentrations of the contaminants of concern detected in samples collected in 2005 are roughly equivalent to those detected in 1999. The proposal recommends the removal of the SVETS as it is not effective in attaining the goals set forth in the Remedial Action Objectives set forth in either the Remedial Action Plan (RAP) or the Final Groundwater Engineering Evaluation/Cost Analysis and Remedial Action Workplan (EE/CA RAW). DTSC concurred with the proposal to decommission the SVETS and requested notification of the commencement of decommissioning and any deviation or modification from this proposal.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Plan
Completed Date: 12/13/2007
Comments: The SAP dated 11/16/7 which was submitted on of PG&E by ARCADIS was approved by DTSC. DTSC reviewed all portions of the document but did not review Appendix E, which is the current Health and Safety Plan, DTSC staff inspecting the Site will be familiar with applicable safety rules and procedures, DTSC does not offer approval of Health and Safety Plans.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 05/09/2007
Comments: DTSC reviewed the reported and concurred with the findings and recommendations.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Financial Assurance Documentation
Completed Date: 02/01/2008
Comments: Following a review by Project and Financial Assurance Unit staff, the initial deposit of $303,648.00 was verified. Four subsequent annual payments are scheduled to be made as specified in the O&M agreement. The future payments will be adjusted as specified in the agreement.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Implementation Workplan
Completed Date: 04/11/2008
Comments: On this date DTSC approved the subject work plan which describes the work proposed to collect analytical samples as well as media for use in potential bench-scale tests. The results of this investigation will be the basis for consideration of a remedial system enhancement. The objective of this work is to yield data for use in identifying a remedial technology that will more effectively reduce toxicity, mobility, volume, and time to remedy site than the current remedy.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 10/29/2010

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 04/05/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 04/29/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 07/21/2011
Comments: On this date, DTSC determined that the report adequately reflects the work completed duting April, May and June of 2011.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 11/22/2011
Comments: On this date, DTSC determined that the report adequately reflects the work completed during July, August and September of 2011.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 02/03/2012
Comments: On this date, DTSC presented findings of the review of the Fourth Quarter 2011 Summary Report. DTSC found that in general, the report adequately summarizes the recent progress. DTSC did note that the Third Quarter 2011 Summary Report was submitted to DTSC on October 27, 2011, not on October 18th as stated in the Fourth Quarter Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 07/15/2014
Comments: DTSC approved the First Quarter 2014 Summary Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 10/16/2014
Comments: DTSC issued its approval of the 2nd Quarter 2014 Quarterly Monitoring Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Treatability Study Report
Completed Date: 06/08/2010
Comments: The Treatability Study concludes that an admixture of 10% Portland cement and 4% granulated activated carbon will achieve the criteria

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set forth in the study. The study did not evaluate the contaminant capture over a range of mixtures. This is a data gap that will have to be addressed during the design phase should this remedy be selected for use at the site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 01/15/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 03/02/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 04/15/2011
Comments: On this date, DTSC accepted the report as written no revision was requested.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 03/20/2012
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Long Term Monitoring Report
Completed Date: 07/16/2014
Comments: DTSC issued its approval of the 2013 Annual Groundwater Monitoring Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 03/15/2010
Comments: On this date DTSC accepted the data presented in the report which was presented in the refined Conceptual Site Model.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 09/02/2010
Comments: On this date, DTSC accepted the additional sampling and results as presented in the report dated August 13, 2010.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operations and Maintenance Manual
Completed Date: 09/22/2010
Comments: On this date the Operation, Maintenance & Monitoring Manual for the GWETS that was rehabilitated/relocated this year. This manual

PG&E - SACRAMENTO SITE (Continued) **S100833174**

replaces the manual specified in paragraph 2.1.1 of the Operation & Maintenance Agreement.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan Amendment
Completed Date: 04/27/2011
Comments: DTSC approved the draft RAP for release on this date. The public comment period for the Draft RAP will commence on April 29, 2011 and will end on May 31, 2011. Fact sheets were mailed for delivery on the 29th and a public notice will be published on the 29th as well. A public meeting is scheduled for May 18 at the Towe Auto Museum in Sacramento. The Draft RAP proposes in-situ soil stabilization/solidification by the addition of Portland Cement and Activated carbon to the areas where the highest contamination is found in the vadose zone. The currently operating Groundwater remedy will continue to operate until RAOs are achieved. Modification of the remedy is necessary as the Ranney Collector, a nearby large volume well was decommissioned in 2009 and the contingent remedy was implemented.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Community Profile
Completed Date: 11/18/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 04/21/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fact Sheets
Completed Date: 04/26/2011
Comments: Fact Sheet will be placed on the Community Involvement page.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Treatability Study Workplan
Completed Date: 03/09/2011
Comments: On this date, DTSC approved the plan to collect further samples for testing to evaluate the usage of granulated activated carbon and powdered activated carbon.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Soils Management Plan
Completed Date: 05/18/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 06/30/2011

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Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Design - Preliminary/Intermediate
Completed Date: 03/13/2012
Comments: On this date, DTSC conditionally approved the RDIP. Twelve conditions which addressed everything from compliance with mitigation measures, monitoring wells and required plans were addressed. The conditional approval was granted in an effort to allow the preliminary construction activities to occur, while final approvals are obtained from other agencies.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Mitigation Monitoring Report
Completed Date: 09/07/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 08/18/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Treatability Study Report
Completed Date: 01/20/2012
Comments: On this date, DTSC accepted the proposal to utilize a 10% Portland Cement and 3% Regen GAC or GAC formulation during the implementation of the remedy selected in the RAP.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment Report
Completed Date: 05/05/1987
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 04/10/2012
Comments: Survey was mailed by PG&E to the appropriate personnel at the Department of Fish & Game.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 06/30/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 02/01/2012
Comments: The annual Land Use Covenant report was accepted as presented on this

PG&E - SACRAMENTO SITE (Continued) **S100833174**

date. The report was included with reports for the three (3) other "Front & T Street sites" (Caltrans I-5 Q Street Off-ramp, Sacramento Housing and Redevelopment Agency and SMUD Front & T Street).

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 07/16/2014
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement
Completed Date: 10/23/2007
Comments: The O&M Agreement is complete for the site. Financial assurance will be completed shortly.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 01/24/2011
Comments: On this date DTSC accepted the Annual Land Use Covenant Inspection Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Litigation Support
Completed Date: 03/08/2013
Comments: On this date this task was completed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 05/19/1993
Comments: Restrictions include no human habitation including residences hospitals, schools for persons under age 21, day-care centers, hotels, motels, or residences for employees. Property owner must maintain integrity of the cap that was placed pursuant to the Remedial Action Plan for the site. This is the Date that the Deed Restriction was recorded in the official records of Sacramento County in Book 93 0519 at Page 1332.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consent Order
Completed Date: 03/30/1988
Comments: Enforceable Agreement H&SC 2535505(a)(1)(C), 205 and 205. The order required limiting access completing an in progress RI/FS, preparation of a RAP and implementation of the RAP.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 02/09/1987
Comments: Responsible Party Preliminary Assessment conducted, reported to DHS. Sample results: Lead = 3000ppm, PNA = 500ppm. Site Screening Done: No documented clean-up.

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 06/20/2014
Comments: DTSC issued a letter outlining unbilled outstanding costs incurred by PG&E between 1989 and 1999.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 12/19/2002
Comments: DES- The Soil Excavation Workplan is the soil removal "Design" that was specified in the May 1991 RAP. The Workplan presents the design to remove approximately 700 Cubic yards of polycyclic aromatic hydrocarbons (PAHs) contaminated soil from Sacramento Housing and Redevelopment Agency (SHRA) property that borders the original PG&E manufactured gas plant.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 12/19/2002
Comments: RMDL/SHRA -- The satisfactory removal of all contaminated soil from the Sacramento Housing and Redevelopment Agency (SHRA) property as specified in the May 1991 Final Remedial Action Plan (RAP) for the Former Sacramento Manufactured Gas Plant Site. Approximately 1200 cubic yards of polycyclic aromatic hydrocarbons (PAHs) contaminated soil from the SHRA property that borders the original PG&E manufactured gas plant.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 04/27/2001
Comments: RAW- The public comment period for the Draft Final Groundwater Engineering Evaluation/Cost Analysis (EE/CA) and Remedial Action Work Plan (RAW) for the Front & T Street Sites, Sacramento CA for the Front Street Joint Defense Group (JDG) ended on April 3, 2001 DTSC received no comment on the above mentioned document and therefore granted final approval for said RAW. The RAW calls for a monitored natural attenuation (MNA) remedy combined with continued operation of the pump and treat system on PG&E Site. A contingent remedy, which will be implemented if Site conditions change, is also funded as a part of this RAW. Implementation of this RAW is designed to meet the groundwater cleanup objectives for all of the Front & T Street Sites. These Sites include: 1) PG&E Sacramento - Former MGP 2) CalTrans I-5, Q Street Offramp 3) SHRA - 1920 Front Street and 4) SMUD - Front and T Street.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedy Constructed: Operating Properly & Successfully
Completed Date: 06/28/1996
Comments: RMDL (GW1) Groundwater treatment plant for the site went online 8/25/95. The system includes 4 extraction wells, 4 reinjection wells, 3 observational piezometers and a carbon filter treatment plant. Groundwater Remediation Extraction Rate (gpd): up to 115,200 gal per

PG&E - SACRAMENTO SITE (Continued) **S100833174**

day.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 01/18/1996
Comments: From a Report of Completion Annual Workplan Activities dated 11/8/95: "IN COMPLIANCE WITH MAY 1991 RAP FOR THIS SITE, SOIL REMEDIATION WAS COMPLETED ON 8/18/95 WITH THE FINAL PLACEMENT OF AN ENGINEERED SITE CAP AND FENCING OF THE SITE PERIMETER. THE ENGINEERED CAP WILL BE MAINTAINED UNDER AN O&M AGREEMENT WHICH IS EXPECTED TO BE FINALIZED IN THE FIRST QUARTER OF 1996.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 05/16/1995
Comments: The extraction and treatment system for the onsite portion of the plume was approved. The system will consist of 4 extraction wells placed along the perimeter in the NE corner of the Site. After extraction, GW will be treated with GAC, followed by disposal of POTW. Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 09/03/1992
Comments: The RP proposed a revised construction alternative for the final site cap, the document entitled " Ground Water Remedial Action Plan for the Sacramento Former Manufactured Gas Plant Site. The approval is found in the fourth paragraph of the September 3, 1992 letter to PG&E captioned"Comments on Ground Water Design Report Pacific Gas and Electric, Sacramento County."

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 12/04/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 04/30/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 12/31/1990
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 01/30/1989
Comments: Not reported

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 05/15/2012
Comments: On this date, (please note that the date of the letter was incorrect on the first page and correct on subsequent pages) DTSC conditionally approved the use of the alternate facility. The conditions were: 1) PG&E is responsible for the accuracy and completeness of the waste profile of the GCL; 2) PG&E is responsible for insuring that the transport of the material complies with the specifications presented in the RDIP; 3)In the event that the GCL is rejected upon arrival at Forward Landfill, PG&E is responsible for returning the GCL to the site and for the proper storage of the GCL until an alternate facility can be identified; and 4) PG&E is responsible for insuring that the transport of the GCL to Manteca is documented in the Green Remediation Evaluation which is included in the final report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 09/08/2009
Comments: On this date, DTSC issued a letter of formally acceptance of the Revised Supplemental Soil Investigation report dated Sept. 1, 2009 as meeting the objectives set forth in the work plan for the investigation.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Soils Management Plan
Completed Date: 08/04/2008
Comments: On this date DTSC approved the plan that describes the excavation an soil emplacement required to perform a legally required visual inspection of the pipe.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Workplan
Completed Date: 09/03/2008
Comments: In a letter dated September 3, 2008 DTSC recieved a request for additional sampling to better meet the objectives presented in the Final Supplemental Soil Investigation Work Plan (Plan) dated March 28, 2008. Given that the collection of additional samples and data will refine the knowledge of the characteristics and volume of soil that requires further remediation, the additional work is hereby approved and incorporated into the Final Supplemental Soil Investigation Work Plan (Plan) dated March 28, 2008. The March 28 Plan was prepared for the Front & T Street Sites, Sacramento, California by ARCADIS for the Pacific Gas and Electric Company (PG&E). Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Soils Management Plan
Completed Date: 01/12/2009
Comments: On this date DTSC issued a letter to PG&E accepting the first draft as complete.

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Treatability Study Workplan
Completed Date:	07/22/2009
Comments:	On this date, DTSC approved the Treatability Study Plan for the in-situ soil stabilization/solidification. The objective of the study is to determine the proper stabilization mixture that will achieve the following: Permeability equal to, or less than, 1 x 10-6 centimeters per second; Unconfined compressive strength equal to or greater than, 30 pounds per square inch; and Reduce leaching of contaminants to groundwater to concentrations below target criteria. Additionally, the study will qualitatively examine vapor generation, temperature increase during treatment, and encapsulation of non-aqueous phase liquids.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Risk Assessment Workplan
Completed Date:	07/29/2009
Comments:	On this date, DTSC approved the "Revised Soil Vapor Assessment Plan dated July 7, 2009. The data generated will be incorporated into the CSM for further evaluation of whether or not remedial action is appropriate for this pathway.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Technical Report
Completed Date:	11/04/2009
Comments:	The RAOs proposal will be revised and presented in a future document. The document will reflect the selection of the alternative remedy and the refinement of the RAOs to reflect that remedy.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Characterization Report
Completed Date:	12/09/2009
Comments:	Not reported

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Removal Action Workplan Amendment
Completed Date:	01/04/2010
Comments:	On July 29, 2009, DTSC requested that PG&E undertake examination of the remedy and evaluate the need for modification or enhancement. On September 11, 2209 the evaluation was presented with a recommendation that the currently operating GWETS be replaced. Rather than shut down the operating system, a replacement will be constructed on-site and placed in operation before the old system is decommissioned. This course of action was approved on this date.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Design - Preliminary/Intermediate
Completed Date:	11/04/2009
Comments:	Not reported

Completed Area Name:	PROJECT WIDE

PG&E - SACRAMENTO SITE (Continued) **S100833174**

Completed Sub Area Name:	Not reported
Completed Document Type:	Other Report
Completed Date:	01/25/2010
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Other Report
Completed Date:	04/22/2010
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Other Report
Completed Date:	08/12/2010
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Land Use Restriction - Site Inspection/Visit
Completed Date:	11/13/2014
Comments:	Not reported
Future Area Name:	PROJECT WIDE
Future Sub Area Name:	Not reported
Future Document Type:	Certification
Future Due Date:	2017
Future Area Name:	PROJECT WIDE
Future Sub Area Name:	Not reported
Future Document Type:	5 Year Review Reports
Future Due Date:	2019
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

BC314 **PG&E - SACRAMENTO SITE** **CA HIST Cal-Sites** **S101272813**
South **2000 FRONT STREET** **N/A**
1/2-1 **SACRAMENTO, CA 95818**
0.834 mi.
4401 ft. **Site 2 of 4 in cluster BC**

Relative:
Higher

Actual:
26 ft.

Calsite:

Region:	SACRAMENTO
Facility ID:	34490048
Facility Type:	RP
Type:	RESPONSIBLE PARTY
Branch:	CC
Branch Name:	CENTRAL CALIFORNIA
File Name:	Not reported
State Senate District:	01011987
Status:	ANNUAL WORKPLAN (AWP) - ACTIVE SITE
Status Name:	ANNUAL WORKPLAN - ACTIVE SITE
Lead Agency:	DEPT OF TOXIC SUBSTANCES CONTROL
NPL:	Not Listed
SIC Code:	49
SIC Name:	ELECTRIC, GAS & SANITARY SERVICES

PG&E - SACRAMENTO SITE (Continued) **S101272813**

Access:	Not reported
Cortese:	Not reported
Hazardous Ranking Score:	Not reported
Date Site Hazard Ranked:	Not reported
Groundwater Contamination:	Confirmed
Staff Member Responsible for Site:	DMANDEL
Supervisor Responsible for Site:	Not reported
Region Water Control Board:	CV
Region Water Control Board Name:	CENTRAL VALLEY
Lat/Long Direction:	Not reported
Lat/Long (dms):	0 0 0 / 0 0 0
Lat/long Method:	Not reported
Lat/Long Description:	Not reported
State Assembly District Code:	09
State Senate District Code:	06
Facility ID:	34490048
Activity:	DISC
Activity Name:	DISCOVERY
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02091987
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	SS
Activity Name:	SITE SCREENING
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02091987
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported

PG&E - SACRAMENTO SITE (Continued) **S101272813**

Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	ORDER
Activity Name:	I/SE, IORSE, FFA, FFSRA, VCA, EA
AWP Code:	ISE
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	03301988
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	PPP
Activity Name:	PUBLIC PARTICIPATION PLAN
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	01301989
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	RIFS
Activity Name:	REMEDIAL INVESTIGATION / FEASIBILITY STUDY

PG&E - SACRAMENTO SITE (Continued) **S101272813**

AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	12311990
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	RAP
Activity Name:	REMEDIAL ACTION PLAN / RECORD OF DECISION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	04301991
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	RA
Activity Name:	REMOVAL ACTION
AWP Code:	SOIL
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	12041991
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP

PG&E - SACRAMENTO SITE (Continued) **S101272813**

Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	43000
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	APPROXIMATELY 43000 CY WERE EXCAVATED AND DISPOSED OF AT KETTLEMANHILLS AND GIBSON OIL RECOVERY.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	DES
Activity Name:	DESIGN
AWP Code:	CAP
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	09031992
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	DEED
Activity Name:	DEED RESTRICTIONS
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05191993
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported

PG&E - SACRAMENTO SITE (Continued) **S101272813**

For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	DES
Activity Name:	DESIGN
AWP Code:	GW1
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	05161995
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	RMDL
Activity Name:	REMEDIAL ACTION (RAP REQUIRED)
AWP Code:	CAP
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	01181996
Est Person-Yrs to complete:	0
Estimated Size:	M
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	X
Well Decommissioned:	Not reported
Action Included Fencing:	X
Removal Action Certification:	N
Activity Comments:	SOIL REMEDIATION WAS COMPLETED WITH THE FINAL PLACEMENT OF AN ENGI-NEERED SITE CAP AND FENCING OF THE SITE PERIMETER.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	RMDL
Activity Name:	REMEDIAL ACTION (RAP REQUIRED)
AWP Code:	GW1

PG&E - SACRAMENTO SITE (Continued) **S101272813**

Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06281996
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	GROUNDWATER TREATMENT PLANT FOR THE SITE WENT ONLINE 8/25/95. THESYSTEM INCLUDES 4 EXTRACTION WELLS, 4 REINJECTION WELLS, 3 OBSERVA-TIONAL PIEZOMETERS, AND A CARBON FILTER TREATMENT PLANT.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	CERT
Activity Name:	CERTIFICATION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	07312005
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	L
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	OM
Activity Name:	OPERATION & MAINTENANCE
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	12312030
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported

PG&E - SACRAMENTO SITE (Continued) **S101272813**

Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	RAW
Activity Name:	REMOVAL ACTION WORKPLAN
AWP Code:	OFFGW
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	04272001
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	RMDL
Activity Name:	REMEDIAL ACTION (RAP REQUIRED)
AWP Code:	SHRA
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	12192002
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	1200
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	X
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	Not reported

PG&E - SACRAMENTO SITE (Continued) **S101272813**

For Commercial Reuse:	0
For Industrial Reuse:	0.30000
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490048
Activity:	DES
Activity Name:	DESIGN
AWP Code:	SHRA
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	10122001
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Alternate Address:	2000 FRONT STREET
Alternate City,St,Zip:	SACRAMENTO, CA 95818
Alternate Address:	FRONT AND T STREETS
Alternate City,St,Zip:	SACRAMENTO, CA
Background Info:	The PG&E Sacramento Site is a former manufactured gas plant that operated from 1873 to 1956 and produced gas from coal and petroleum as raw material. The contaminants found onsite are polycyclic aromatic hydrocarbons (PAH); total petroleum hydrocarbons (TPH); benzene, toluene, xylene, and ethylbenzene (B, T, X & E) and heavy metals in soil and groundwater. The site is currently paved to control soil migration and exposure. Groundwater contamination has not affected any domestic wells. PG&E signed an enforceable agreement with Department of Toxic Substances Control (DTSC) in March 1988. PG&E completed an onsite Remedial Investigation (RI) in March 1989 and offsite groundwater RI in June 1990. In October 1990, PG&E submitted an Feasibility Study and submitted the draft Remedial Action Plan (RAP) in November 1990. A final RAP was issued in May 1991. The proposed final remediation included excavation of highly contaminated soils and offsite disposal, capping of remaining contamination and a groundwater extraction and treatment system. Contaminated soil was removed in November 1991. The groundwater treatment plant for the site went online during August 1995. The system includes 4 extraction wells, 4 reinjection wells, 3 observational piezometers and a carbon filter treatment plant. The Final Remedial Investigation and Removal Action reports,completed on September 1999, concluded that under current site conditions, protection of human health and the environment is achieved and that additional groundwater

PG&E - SACRAMENTO SITE (Continued) **S101272813**

remediation is not necessary beyond the remedial processes in place.
The Final Groundwater Engineering Evaluation/Cost Analysis (EE/CA) and Remedial Action Work Plan (RAW) for the Front & T Street Sites, Sacramento, California was completed on April 2001. The report was prepared for the Front Street Joint Defense Group (JDG) that consists of the following sites: 1) PG&E Sacramento, Former MGP; 2) Cal Trans I-5, Q Street off-ramp; 3) Sacramento Housing and Redevelopment Agency-1920 Front Street; 4) SMUD - Front and T Street. The RAW implements a monitored natural attenuation(MNA) remedy combined with continued operation of the pump and treat system on the PG&E Site. A contingent remedy, which will be implemented if Site conditions change, was funded as a part of the RAW. The RAW implements the groundwater cleanup objectives for all of the Front & T Street Sites.
PG&E has accepted responsibility for monitoring and maintenance of all implemented remedies at all the Front Street JDG sites. PG&E will continue to monitor the remaining groundwater contamination via a regularly scheduled sampling and monitoring program.

Comments Date: 07251991
Comments: BTX+E, TPH, and heavy metals in soil and groundwater.
Comments Date: 09081989
Comments: EPA completed Screening Site Inspection and recommend
Comments Date: 09081989
Comments: Listing Site Inspection; Strong DHS lead - low-priority for
Comments Date: 09081989
Comments: EPA unless problems arise.
Comments Date: 09301999
Comments: A Draft RI Report was filed for offsite groundwater contamination
Comments Date: 10122001
Comments: DES- The Soil Excavation Workplan is the soil removal "Design"
Comments Date: 10122001
Comments: that was specified in the May 1991 RAP. The Workplan presents
Comments Date: 10122001
Comments: the design to remove approximately 700 Cubic yards of polycyclic
Comments Date: 10122001
Comments: aromatic hydrocarbons (PAHs) contaminated soil from Sacramento
Comments Date: 10122001
Comments: Housing and Redevelopment Agency (SHRA) property that borders the
Comments Date: 10122001
Comments: original PG&E manufactured gas plant.
Comments Date: 11301991
Comments: Removal Action: Soil excavation.
Comments Date: 12192002
Comments: RMDL/SHRA -- The satisfactory removal of all contaminated soil
Comments Date: 12192002
Comments: from the Sacramento Housing and Redevelopment Agency (SHRA)
Comments Date: 12192002
Comments: property as specified in the May 1991 Final Remedial Action Plan
Comments Date: 12192002
Comments: (RAP) for the Former Sacramento Manufactured Gas Plant Site.
Comments Date: 12192002
Comments: Approximately 1200 cubic yards of polycyclic aromatic
Comments Date: 12192002
Comments: hydrocarbons (PAHs) contaminated soil from the SHRA property that
Comments Date: 12192002

PG&E - SACRAMENTO SITE (Continued) **S101272813**

Comments:	borders the original PG&E manufactured gas plant.
Comments Date:	06281996
Comments:	carbon filter treatment plant.
Comments Date:	06281996
Comments:	Groundwater Remediation Extraction Rate (gpd): up to
Comments Date:	06281996
Comments:	115,200 gal per day.
Comments Date:	01011987
Comments:	This is the date the site was first listed pursuant to
Comments Date:	01011987
Comments:	section 25356.
Comments Date:	01181996
Comments:	IN COMPLIANCE WITH MAY 1991 RAP FOR THIS SITE, SOIL REMED-
Comments Date:	01181996
Comments:	IATION WAS COMPLETED ON 8/18/95 WITH THE FINAL PLACEMENT
Comments Date:	01181996
Comments:	OF AN ENGINEERED SITE CAP AND FENCING OF THE SITE PERI-
Comments Date:	01181996
Comments:	METER. THE ENGINEERED CAP WILL BE MAINTAINED UNDER AN
Comments Date:	01181996
Comments:	O&M AGREEMENT WHICH IS EXPECTED TO BE FINALIZED IN THE
Comments Date:	01181996
Comments:	FIRST QUARTER OF 1996.
Comments Date:	02091987
Comments:	Responsible Party Preliminary Assessment conducted, reported
Comments Date:	02091987
Comments:	to DHS. Sample results: Lead = 3000ppm, PNA = 500ppm.
Comments Date:	02091987
Comments:	Site Screening Done: No documented clean-up.
Comments Date:	02181993
Comments:	DEED -- A deed restriction was approved and issued. This
Comments Date:	02181993
Comments:	deed restriction was warranted because some soil
Comments Date:	02181993
Comments:	contamination was left in place. The site will also be
Comments Date:	02181993
Comments:	capped at a later date. Costs are unknown (RP funded)
Comments Date:	04272001
Comments:	RAW- The public comment period for the Draft Final Groundwater
Comments Date:	04272001
Comments:	Engineering Evaluation/Cost Analysis (EE/CA) and Remedial Action
Comments Date:	04272001
Comments:	Work Plan (RAW) for the Front & T Street Sites, Sacramento CA for
Comments Date:	04272001
Comments:	the Front Street Joint Defense Group (JDG) ended on April 3, 2001
Comments Date:	04272001
Comments:	DTSC received no comment on the above mentioned document and
Comments Date:	04272001
Comments:	therefore granted final approval for said RAW.
Comments Date:	04272001
Comments:	The RAW calls for a monitored natural attenuation (MNA) remedy
Comments Date:	04272001
Comments:	combined with continued operation of the pump and treat system
Comments Date:	04272001
Comments:	on PG&E Site. A contingent remedy, which will be implemented if
Comments Date:	04272001
Comments:	Site conditions change, is also funded as a part of this RAW.

PG&E - SACRAMENTO SITE (Continued) **S101272813**

Comments Date:	04272001
Comments:	Implementation of this RAW is designed to meet the groundwater
Comments Date:	04272001
Comments:	cleanup objectives for all of the Front & T Street Sites. These
Comments Date:	04272001
Comments:	Sites include: 1) PG&E Sacramento - Former MGP 2) CalTrans I-5,
Comments Date:	04272001
Comments:	Q Street Offramp 3) SHRA - 1920 Front Street and 4) SMUD - Front
Comments Date:	04272001
Comments:	and T Street.
Comments Date:	05161995
Comments:	The extraction and treatment system for the onsite portion
Comments Date:	05161995
Comments:	of the plume was approved. The system will consist of 4
Comments Date:	05161995
Comments:	extraction wells placed along the perimeter in the NE corner
Comments Date:	05161995
Comments:	of the Site. After extraction, GW will be treated with GAC,
Comments Date:	05161995
Comments:	followed by disposal of POTW.
Comments Date:	06281996
Comments:	RMDL (GW1) Groundwater treatment plant for the site went
Comments Date:	06281996
Comments:	online 8/25/95. The system includes 4 extraction wells,
Comments Date:	06281996
Comments:	4 reinjection wells, 3 observational piezometers and a
Comments Date:	07251991
Comments:	Former manufactured gas plant. Contaminants include PAH,
ID Name:	BEP DATABASE PCODE
ID Value:	P12143
ID Name:	EPA IDENTIFICATION NUMBER
ID Value:	CAD981415557
ID Name:	CALSTARS CODE
ID Value:	100160
Alternate Name:	PACIFIC GAS & ELECTRIC - SACRAMENTOPG&E MANUFACTURED GAS PLANT SV-SA-SAC-1PG&E - SACRAMENTO SITE
Special Programs Code:	Not reported
Special Programs Name:	Not reported

BC315 **PG AND E SACRAMENTO SITE** **EDR MGP** **1008407745**
South **2000 FRONT STREET** **N/A**
1/2-1 **SACRAMENTO, CA 95818**
0.834 mi.
4401 ft. **Site 3 of 4 in cluster BC**

Relative:
Higher

Actual:
26 ft.

Manufactured Gas Plants:

The PG AND E Sacramento Site is a former manufactured gas plant that operated from 1873 to 1956 and produced gas from coal and petroleum as raw material. The contaminants found onsite are polycyclic aromatic hydrocarbons (PAH); total petroleum hydroccarbons (TPH); benzene, toluene, xylene, and ethylbenzene (B, T, X and E) and heavy metals in soil and groundwater. The site is currently paved to control soil migration and exposure

316
WSW
1/2-1
0.849 mi.
4482 ft.

PAYLESS CLEANERS (2)
1351 MERKLEY AVENUE
WEST SACRAMENTO, CA 95691

CA ENVIROSTOR **S101482950**
N/A

Relative:
Higher

Actual:
24 ft.

ENVIROSTOR:

Facility ID:	57720002
Status:	Refer: Other Agency
Status Date:	11/16/1994
Site Code:	Not reported
Site Type:	Historical
Site Type Detailed:	* Historical
Acres:	Not reported
NPL:	NO
Regulatory Agencies:	NONE SPECIFIED
Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	Referred - Not Assigned
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not reported
Latitude:	38.57893
Longitude:	-121.5252
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC:	NONE SPECIFIED
Confirmed COC:	NONE SPECIFIED
Potential Description:	NONE SPECIFIED
Alias Name:	57720002
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	Not reported
Completed Sub Area Name:	Not reported
Completed Document Type:	Not reported
Completed Date:	Not reported
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

BC317 **CALTRANS, I-5 Q STREET OFF-RAMP** **CA DEED** **S109548227**
South **I-5 Q STREET OFF-RAMP** **CA RESPONSE** **N/A**
1/2-1 **SACRAMENTO, CA 95814** **CA ENVIROSTOR**
0.854 mi.
4507 ft. **Site 4 of 4 in cluster BC**

Relative:
Higher

Actual:
26 ft.

DEED:

Envirostor ID:	34240037
Area:	PROJECT WIDE
Sub Area:	Not reported
Site Type:	STATE RESPONSE
Status:	CERTIFIED O&M - LAND USE RESTRICTIONS ONLY
Agency:	Not reported
Covenant Uploaded:	Not reported
Deed Date(s):	06/30/2006

RESPONSE:

Facility ID:	34240037
Site Type:	State Response
Site Type Detail:	State Response or NPL
Acres:	0.56
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP, RWQCB 5S - Central Valley
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Harold (Bud) Duke
Supervisor:	Jose Salcedo
Division Branch:	Northern California Schools & Santa Susana
Site Code:	100416
Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	07
Senate:	06
Special Program Status:	Not reported
Status:	Certified O&M - Land Use Restrictions Only
Status Date:	09/14/2010
Restricted Use:	YES
Funding:	Responsible Party
Latitude:	38.57333
Longitude:	-121.5097
APN:	017100, 017101, 017126
Past Use:	FUEL - VEHICLE STORAGE/ REFUELING, MANUFACTURING - LUMBER/WOOD PRODUCTS
Potential COC :	Benzene TPH-gas Ethylbenzene Polynuclear aromatic hydrocarbons (PAHs Toluene Xylenes
Confirmed COC:	Benzene Polynuclear aromatic hydrocarbons (PAHs TPH-gas Ethylbenzene Toluene Xylenes
Potential Description:	OTH, SOIL
Alias Name:	017100
Alias Type:	APN
Alias Name:	017101
Alias Type:	APN
Alias Name:	017126
Alias Type:	APN
Alias Name:	110033618306
Alias Type:	EPA (FRS #)
Alias Name:	100416
Alias Type:	Project Code (Site Code)
Alias Name:	34240037
Alias Type:	Envirostor ID Number

CALTRANS, I-5 Q STREET OFF-RAMP (Continued) **S109548227**

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date:	08/16/1993
Comments:	Order issued to CalTrans required an RI/FS, RAP. This order also required that a Preliminary Assessment be completed and that the characterization could be a two-phased approach: Phase one, to determine if the site is a source of the groundwater contamination detected in the area; and Phase two the remediation of soil and groundwater contamination if applicable.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Investigation / Feasibility Study
Completed Date:	05/20/1996
Comments:	RIFS/SOIL -- Approved Final Feasibility Study for soil remediation on the site. Subject to the results of the pilot study, CalTrans will complete a RAW calling for soil remediation utilizing bioventing and an engineered cap.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Monitoring Report
Completed Date:	05/23/2007
Comments:	The draft Focused Feasibility Study was submitted on behalf of Pacific Gas and Electric Company (PG&E) for the Front and T Streets Sites. DTSC comments are scheduled to be provided by March 21, 2007.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Pilot/Treatability Study Report
Completed Date:	12/11/2006
Comments:	This study was submitted 20 days later than expected.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Financial Assurance Documentation
Completed Date:	02/01/2008
Comments:	Following a review by Project and Financial Assurance Unit staff, the initial deposit of $303,648.00 was verified. Four subsequent annual payments are scheduled to be made as specified in the O&M agreement. The future payments will be adjusted as specified in the agreement.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Land Use Restriction - Site Inspection/Visit
Completed Date:	10/01/2007
Comments:	DTSC issued a letter which reported that the inspection revealed that the site conditions were in compliance with the LUC.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	* Land Use Restriction Monitoring Report
Completed Date:	02/01/2012
Comments:	The annual Land Use Covenant report was accepted as presented on this date. The report was included with reports for the three (3) other

CALTRANS, I-5 Q STREET OFF-RAMP (Continued) **S109548227**

"Front & T Street sites" (PG&E - Sacramento Site, Sacramento Housing and Redevelopment Agency and SMUD Front & T Street).

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 04/30/2008
Comments: On this date the certification form was signed and uploaded to the system.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 06/27/1997
Comments: DTSC signed a NOE and filed it. A 30 day comment period was held. The NOE is associated with the Removal Action to address contaminated soil at the site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement
Completed Date: 10/23/2007
Comments: The O&M Agreement is complete for the site. Financial assurance will be completed shortly.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 04/27/2001
Comments: RAW - The public comment period for the Draft Final Groundwater Engineering Evaluation/Cost Analysis (EE/CA) and Remedial Action Work Plan (RAW) for the Front & T Street sites, Sacramento, California, for the Front Street Joint Defense Group (JDG) ended on April 3, 2001. DTSC received no comment on the above mentioned document and therefore granted final approval for said RAW. The RAW calls for a monitored natural attenuation (MNA) remedy combined with continued operation of the pump and treat system on PG&E site. A contingent remedy, which will be implemented if Site conditions change, is also funded as part of this RAW. Implementation of this RAW is designed to meet the groundwater cleanup objectives for all of the Front & T Street Sites. These Sites include: 1) PG&E Sacramento - Former MGP 2) CalTrans I-5, Q Street Off-ramp 3) SHRA - 1920 Front Street and 4) SMUD - Front and T Street.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 06/16/1999
Comments: RA/SOIL - Excavation and removal of 18,550 metric tons of soil contaminated with PAH's and BTEX. Excavation was back filled with clean material and a soil vapor extraction system was installed to remove contaminants below the depth of excavation. The excavation was done jointly with SMUD.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan

CALTRANS, I-5 Q STREET OFF-RAMP (Continued) **S109548227**

Completed Date: 06/27/1997
Comments: CEQA -- Prepared CEQA documents for a proposed Neg. Dec. Held a 30-day public comment period on proposed project. Received no comments, so Neg. Dec. was finalized on 6/27/97. RAW/SOIL -- Completed a Neg. Dec. under CEQA. Received no comments during the comment period. Approved the Removal Action Workplan which includes excavation of approximately 12,200 cu yds. of contaminated soil, installation of a seasonal soil vapor extraction system, and returning the surface to its current condition.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 02/24/2010
Comments: On this date DTSC amended the report to inclusde a brief discussion of the Front Street Well abandonment and accepted the findings of the 2009 LUC Inspection Report

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 01/24/2011
Comments: On this date DTSC accepted the Annual Land Use Covenant Inspection Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 01/21/2009
Comments: On this date DTSC concurred with the findings of the annual LUC inspection report. The site is being used in a manner consistent with the prohibitions and limitations specified in the LUC.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 06/30/2006
Comments: On July 12, 2006 the fully executed Land Use Covenant was recorded in the office of the Sacramento County Assessor in Book 20060701 at Page 0999.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

ENVIROSTOR:
Facility ID: 34240037
Status: Certified O&M - Land Use Restrictions Only
Status Date: 09/14/2010
Site Code: 100416
Site Type: State Response

CALTRANS, I-5 Q STREET OFF-RAMP (Continued) **S109548227**

Site Type Detailed: State Response or NPL
Acres: 0.56
NPL: NO
Regulatory Agencies: SMBRP, RWQCB 5S - Central Valley
Lead Agency: SMBRP
Program Manager: Harold (Bud) Duke
Supervisor: Jose Salcedo
Division Branch: Northern California Schools & Santa Susana
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: YES
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.57333
Longitude: -121.5097
APN: 017100, 017101, 017126
Past Use: FUEL - VEHICLE STORAGE/ REFUELING, MANUFACTURING - LUMBER/WOOD PRODUCTS
Potential COC: Benzene TPH-gas Ethylbenzene Polynuclear aromatic hydrocarbons (PAHs Toluene Xylenes
Confirmed COC: Benzene Polynuclear aromatic hydrocarbons (PAHs TPH-gas Ethylbenzene Toluene Xylenes
Potential Description: OTH, SOIL
Alias Name: 017100
Alias Type: APN
Alias Name: 017101
Alias Type: APN
Alias Name: 017126
Alias Type: APN
Alias Name: 110033618306
Alias Type: EPA (FRS #)
Alias Name: 100416
Alias Type: Project Code (Site Code)
Alias Name: 34240037
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 08/16/1993
Comments: Order issued to CalTrans required an RI/FS, RAP. This order also required that a Preliminary Assessment be completed and that the characterization could be a two-phased approach: Phase one, to determine if the site is a source of the groundwater contamination detected in the area; and Phase two the remediation of soil and groundwater contamination if applicable.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 05/20/1996
Comments: RIFS/SOIL -- Approved Final Feasibility Study for soil remediation on the site. Subject to the results of the pilot study, CalTrans will complete a RAW calling for soil remediation utilizing bioventing and an engineered cap.

CALTRANS, I-5 Q STREET OFF-RAMP (Continued) **S109548227**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/23/2007
Comments: The draft Focused Feasibility Study was submitted on behalf of Pacific Gas and Electric Company (PG&E) for the Front and T Streets Sites. DTSC comments are scheduled to be provided by March 21, 2007.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Pilot/Treatability Study Report
Completed Date: 12/11/2006
Comments: This study was submitted 20 days later than expected.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Financial Assurance Documentation
Completed Date: 02/01/2008
Comments: Following a review by Project and Financial Assurance Unit staff, the initial deposit of $303,648.00 was verified. Four subsequent annual payments are scheduled to be made as specified in the O&M agreement. The future payments will be adjusted as specified in the agreement.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction - Site Inspection/Visit
Completed Date: 10/01/2007
Comments: DTSC issued a letter which reported that the inspection revealed that the site conditions were in compliance with the LUC.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 02/01/2012
Comments: The annual Land Use Covenant report was accepted as presented on this date. The report was included with reports for the three (3) other "Front & T Street sites" (PG&E - Sacramento Site, Sacramento Housing and Redevelopment Agency and SMUD Front & T Street).

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 04/30/2008
Comments: On this date the certification form was signed and uploaded to the system.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 06/27/1997
Comments: DTSC signed a NOE and filed it. A 30 day comment period was held. The NOE is associated with the Removal Action to address contaminated soil at the site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement

CALTRANS, I-5 Q STREET OFF-RAMP (Continued) **S109548227**

Completed Date: 10/23/2007
Comments: The O&M Agreement is complete for the site. Financial assurance will be completed shortly.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 04/27/2001
Comments: RAW - The public comment period for the Draft Final Groundwater Engineering Evaluation/Cost Analysis (EE/CA) and Remedial Action Work Plan (RAW) for the Front & T Street sites, Sacramento, California, for the Front Street Joint Defense Group (JDG) ended on April 3, 2001. DTSC received no comment on the above mentioned document and therefore granted final approval for said RAW. The RAW calls for a monitored natural attenuation (MNA) remedy combined with continued operation of the pump and treat system on PG&E site. A contingent remedy, which will be implemented if Site conditions change, is also funded as part of this RAW. Implementation of this RAW is designed to meet the groundwater cleanup objectives for all of the Front & T Street Sites. These Sites include: 1) PG&E Sacramento - Former MGP 2) CalTrans I-5, Q Street Off-ramp 3) SHRA - 1920 Front Street and 4) SMUD - Front and T Street.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 06/16/1999
Comments: RA/SOIL - Excavation and removal of 18,550 metric tons of soil contaminated with PAH's and BTEX. Excavation was back filled with clean material and a soil vapor extraction system was installed to remove contaminants below the depth of excavation. The excavation was done jointly with SMUD.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 06/27/1997
Comments: CEQA -- Prepared CEQA documents for a proposed Neg. Dec. Held a 30-day public comment period on proposed project. Received no comments, so Neg. Dec. was finalized on 6/27/97. RAW/SOIL -- Completed a Neg. Dec. under CEQA. Received no comments during the comment period. Approved the Removal Action Workplan which includes excavation of approximately 12,200 cu yds. of contaminated soil, installation of a seasonal soil vapor extraction system, and returning the surface to its current condition.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 02/24/2010
Comments: On this date DTSC amended the report to inclusde a brief discussion of the Front Street Well abandonment and accepted the findings of the 2009 LUC Inspection Report

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report

CALTRANS, I-5 Q STREET OFF-RAMP (Continued) **S109548227**

Completed Date:	01/24/2011
Comments:	On this date DTSC accepted the Annual Land Use Covenant Inspection Report.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	* Land Use Restriction Monitoring Report
Completed Date:	01/21/2009
Comments:	On this date DTSC concurred with the findings of the annual LUC inspection report. The site is being used in a manner consistent with the prohibitions and limitations specified in the LUC.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Land Use Restriction
Completed Date:	06/30/2006
Comments:	On July 12, 2006 the fully executed Land Use Covenant was recorded in the office of the Sacramento County Assessor in Book 20060701 at Page 0999.
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

318
WSW
1/2-1
0.876 mi.
4627 ft.

FABRICARE ONE HOUR MARTINIZING #2 **CA ENVIROSTOR** **S107736310**
827 JEFFERSON BOULEVARD **N/A**
WEST SACRAMENTO, CA 95691

Relative:
Higher

Actual:
24 ft.

ENVIROSTOR:

Facility ID:	57720005
Status:	Refer: Other Agency
Status Date:	11/16/1994
Site Code:	Not reported
Site Type:	Historical
Site Type Detailed:	* Historical
Acres:	Not reported
NPL:	NO
Regulatory Agencies:	NONE SPECIFIED
Lead Agency:	NONE SPECIFIED
Program Manager:	Not reported
Supervisor:	Referred - Not Assigned
Division Branch:	Cleanup Sacramento
Assembly:	04
Senate:	03
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Not reported
Latitude:	38.47805
Longitude:	-121.5808

FABRICARE ONE HOUR MARTINIZING #2 (Continued) **S107736310**

APN: NONE SPECIFIED
Past Use: NONE SPECIFIED
Potential COC: NONE SPECIFIED
Confirmed COC: NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: 57720005
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: Not reported
Completed Sub Area Name: Not reported
Completed Document Type: Not reported
Completed Date: Not reported
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

319
SSE
1/2-1
0.878 mi.
4634 ft.

723 S STREET
723 S STREET
SACRAMENTO, CA 95814

CA SLIC **S102430782**
CA Sacramento Co. CS **N/A**
CA ENVIROSTOR

Relative:
Higher

Actual:
19 ft.

SLIC:
Region: STATE
Facility Status: **Open - Inactive**
Status Date: 07/02/1994
Global Id: SLT5S0243065
Lead Agency: CENTRAL VALLEY RWQCB (REGION 5S)
Lead Agency Case Number: Not reported
Latitude: 38.5715133863542
Longitude: -121.500817537308
Case Type: Cleanup Program Site
Case Worker: ZZZ
Local Agency: Not reported
RB Case Number: SLT5S024
File Location: Not reported
Potential Media Affected: Soil
Potential Contaminants of Concern: Not reported
Site History: Not reported

Click here to access the California GeoTracker records for this facility:

Sacramento Co. CS:
State Site Number: A299
Lead Staff: Booth, D.
Lead Agency: HM
Remedial Action Taken: YE, S
Substance: 0
Date Reported: 02/18/1994

723 S STREET (Continued) **S102430782**

Facility Id: RO0001035
Case Type: Soil only
Case Closed: Y
Date Closed: Not reported

ENVIROSTOR:
Facility ID: 34990003
Status: Refer: Other Agency
Status Date: 07/28/1994
Site Code: Not reported
Site Type: Evaluation
Site Type Detailed: Evaluation
Acres: 1
NPL: NO
Regulatory Agencies: NONE SPECIFIED
Lead Agency: NONE SPECIFIED
Program Manager: Not reported
Supervisor: Referred - Not Assigned
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Not reported
Latitude: 38.57155
Longitude: -121.5008
APN: NONE SPECIFIED
Past Use: NONE SPECIFIED
Potential COC: NONE SPECIFIED
Confirmed COC: NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: 723 S STREET
Alias Type: Alternate Name
Alias Name: 34990003
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: Not reported
Completed Sub Area Name: Not reported
Completed Document Type: Not reported
Completed Date: Not reported
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

BD320 **SMUD, FRONT & T STREETS** **CA HIST Cal-Sites** **S101482984**
South **FRONT & T STREETS** **CA DEED** **N/A**
1/2-1 **SACRAMENTO, CA 95814** **CA RESPONSE**
0.895 mi. **CA ENVIROSTOR**
4724 ft. **Site 1 of 2 in cluster BD**

Relative:
Higher

Actual:
24 ft.

Calsite:

Region:	SACRAMENTO
Facility ID:	34490057
Facility Type:	RP
Type:	RESPONSIBLE PARTY
Branch:	CC
Branch Name:	CENTRAL CALIFORNIA
File Name:	Not reported
State Senate District:	01011995
Status:	ANNUAL WORKPLAN (AWP) - ACTIVE SITE
Status Name:	ANNUAL WORKPLAN - ACTIVE SITE
Lead Agency:	DEPT OF TOXIC SUBSTANCES CONTROL
NPL:	Not Listed
SIC Code:	49
SIC Name:	ELECTRIC, GAS & SANITARY SERVICES
Access:	Uncontrolled
Cortese:	Not reported
Hazardous Ranking Score:	Not reported
Date Site Hazard Ranked:	Not reported
Groundwater Contamination:	Not reported
Staff Member Responsible for Site:	Not reported
Supervisor Responsible for Site:	Not reported
Region Water Control Board:	CV
Region Water Control Board Name:	CENTRAL VALLEY
Lat/Long Direction:	Not reported
Lat/Long (dms):	0 0 0 / 0 0 0
Lat/long Method:	Not reported
Lat/Long Description:	Not reported
State Assembly District Code:	09
State Senate District Code:	06
Facility ID:	34490057
Activity:	ORDER
Activity Name:	I/SE, IORSE, FFA, FFSRA, VCA, EA
AWP Code:	I&SE
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	02011995
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0

SMUD, FRONT & T STREETS (Continued) **S101482984**

Unknown Type:	0
Facility ID:	34490057
Activity:	RIFS
Activity Name:	REMEDIAL INVESTIGATION / FEASIBILITY STUDY
AWP Code:	SOIL
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06161997
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490057
Activity:	CERT
Activity Name:	CERTIFICATION
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	07312005
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490057
Activity:	RAW
Activity Name:	REMOVAL ACTION WORKPLAN
AWP Code:	SOIL
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06271997

SMUD, FRONT & T STREETS (Continued) **S101482984**

Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490057
Activity:	RA
Activity Name:	REMOVAL ACTION
AWP Code:	SOIL
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06161999
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	18550
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	N
Activity Comments:	EXCAVATION AND REMOVAL OF 18,550 METRIC TONS OF SOIL CONTAMINATED WITHPAH'S AND BTEX.
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490057
Activity:	CEQA
Activity Name:	CEQA INCLUDING NEGATIVE DECS
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	06271997
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported

SMUD, FRONT & T STREETS (Continued) **S101482984**

Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490057
Activity:	RAW
Activity Name:	REMOVAL ACTION WORKPLAN
AWP Code:	OFFGW
Proposed Budget:	0
AWP Completion Date:	Not reported
Revised Due Date:	Not reported
Comments Date:	04272001
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Facility ID:	34490057
Activity:	OM
Activity Name:	OPERATION & MAINTENANCE
AWP Code:	Not reported
Proposed Budget:	0
AWP Completion Date:	12312030
Revised Due Date:	Not reported
Comments Date:	Not reported
Est Person-Yrs to complete:	0
Estimated Size:	Not reported
Request to Delete Activity:	Not reported
Activity Status:	AWP
Definition of Status:	ANNUAL WORKPLAN - ACTIVE SITE
Liquids Removed (Gals):	0
Liquids Treated (Gals):	0
Action Included Capping:	Not reported
Well Decommissioned:	Not reported
Action Included Fencing:	Not reported
Removal Action Certification:	Not reported
Activity Comments:	Not reported
For Commercial Reuse:	0
For Industrial Reuse:	0
For Residential Reuse:	0
Unknown Type:	0
Alternate Address:	FRONT & T STREETS

SMUD, FRONT & T STREETS (Continued) **S101482984**

Alternate City,St,Zip:	SACRAMENTO, CA 95814
Background Info:	The Sacramento Municipal Utility District (SMUD) site is located near the former intersection of Front and T Streets in Sacramento and adjacent to the California Department of Transportation (CalTrans) property. The SMUD site was discovered during the groundwater investigation for the PG&E -Sacramento site. Soil boring analyses indicated that site was a source of petroleum hydrocarbon contamination to the groundwater. The Department issued a Remedial Action Order on 08/16/1993 to SMUD and CalTrans. Contaminated soil was excavated at the SMUD and CalTrans sites during fall 1998. A seasonal soil vapor extraction system, to remove contaminants below the depth of excavation, began operations on 10/31/1999. This system operates on both the SMUD and the adjacent CalTrans site. The Final Groundwater Engineering Evaluation/Cost Analysis (EE/CA) and Remedial Action Work Plan (RAW) for the Front & T Street Sites, Sacramento, California was completed in April 2001. The report was prepared for the Front Street Joint Defense Group (JDG) that consists of the following sites: 1) PG&E Sacramento; Former MGP; 2) CalTrans I-5, Q Street Off-ramp; 3) SHRA - 1920 Front Street; 4) SMUD - Front and T Street. The RAW implements a monitored attenuation (MNA) remedy combined with continued operation of the pump and treat system on the P G & E site. A contingent remedy, which will be implemented if site conditions change, was funded as a part of the RAW. The RAW implements the groundwater cleanup objectives for all of the Front & T Street Sites. PG&E has accepted responsibility for monitoring and maintenance of all implemented remedies at all the Front Street JDG sites. PG&E will continue to monitor the remaining groundwater contamination via a regularly scheduled sampling and monitoring program.
Comments Date:	04272001
Comments:	RAW - The pubilc comment period for the Draft Final Groundwater
Comments Date:	04272001
Comments:	Engineering Evaluation/Cost Analysis (EE/CA) and Remedial Action
Comments Date:	04272001
Comments:	Work Plan (RAW) for the Front & T Street sites, Sacramento,
Comments Date:	04272001
Comments:	California for the Front Street Joint Defense Group (JDG) ended
Comments Date:	04272001
Comments:	on April 3, 2001. DTSC received no comment on the above
Comments Date:	04272001
Comments:	mentioned document and therefore granted final approval for
Comments Date:	04272001
Comments:	said RAW. The RAW calls for a monitored natural attenuation
Comments Date:	04272001
Comments:	(MNA) remedy combined with continued operation of the pump and
Comments Date:	04272001
Comments:	treat system on PG&E site. A contingent remedy, which will be
Comments Date:	04272001
Comments:	implemented if Site conditions change, is also funded as a part
Comments Date:	04272001
Comments:	of this RAW. Implementation of this RAW is designed to meet
Comments Date:	04272001
Comments:	the groundwater cleanup objectives for all of the Front & T
Comments Date:	04272001

SMUD, FRONT & T STREETS (Continued) **S101482984**

Comments: Street sites. These sites include: 1) PG&E Sacramento- Former
Comments Date: 04272001
Comments: MGP 2) CalTrans I-5, Q Street Off-ramp 3) SHRA - 1920 Front
Comments Date: 04272001
Comments: Street and 4) SMUD - Front and T Street.
Comments Date: 06161997
Comments: RIFS/SOIL -- Completed a RI/FS for soil for the site. SMUD is
Comments Date: 06161997
Comments: working with CalTrans, who has an adjacent site, on a joint
Comments Date: 06161997
Comments: Removal Action Workplan.
Comments Date: 06161999
Comments: RA/SOIL - Excavation and removal of 18,550 metric tons of soil
Comments Date: 06161999
Comments: contaminated with PAH's and BTEX. Excavation was back filled
Comments Date: 06161999
Comments: with clean material and a soil vapor extraction system was
Comments Date: 06161999
Comments: installed to remove contaminants below the depth of excavation.
Comments Date: 06161999
Comments: The excavation was done jointly with CALTRANS.
Comments Date: 06271997
Comments: CEQA -- Prepared CEQA documents for a proposed Neg. Dec.
Comments Date: 06271997
Comments: Held a 30-day public comment period on the proposed project.
Comments Date: 06271997
Comments: Received no comments, so Neg. Dec. was finalized on 6/27/97.
Comments Date: 06271997
Comments: RAW/SOIL -- Completed Neg Dec under CEQA. Approved Removal
Comments Date: 06271997
Comments: Action Workplan, which includes excavation of approximately
Comments Date: 06271997
Comments: 12,200 cu yds of contaminated soil, installation of a season
Comments Date: 06271997
Comments: soil vapor extraction system and returned the surface to its
Comments Date: 06271997
Comments: original condition. This work is to be done jointly with
Comments Date: 06271997
Comments: CalTrans who is the RP on the adjacent site.
Comments Date: 10311999
Comments: RA/SOIL-A sesonal soil vapor extraction system began operations.
Comments Date: 10311999
Comments: This system should remove the remaining soil contaminants which
Comments Date: 10311999
Comments: could not be excavated because they are below the groundwater
Comments Date: 10311999
Comments: level. This system operates on this site and the adjacent
Comments Date: 10311999
Comments: CALTRANS site.
ID Name: CALSTARS CODE
ID Value: 100549
Alternate Name: SMUD, FRONT & T STREETS
Special Programs Code: Not reported
Special Programs Name: Not reported

DEED:
Envirostor ID: 34490057

SMUD, FRONT & T STREETS (Continued) **S101482984**

Area: PROJECT WIDE
Sub Area: Not reported
Site Type: STATE RESPONSE
Status: CERTIFIED O&M - LAND USE RESTRICTIONS ONLY
Agency: Not reported
Covenant Uploaded: Not reported
Deed Date(s): 11/07/2006

AWP:
AWP Facility ID: 34490057
Region Code: 1
Region: SACRAMENTO
SMBR Branch Code: CC
SMBR Branch Unit: CENTRAL CALIFORNIA
Site Name.: Not reported
Current Status Date: 01011995
Current Status: ANNUAL WORKPLAN - ACTIVE SITE
Lead Agency Code: DTSC
Lead Agency: DEPT OF TOXIC SUBSTANCES CONTROL
Facility Type: responsible party
Awp Site Type: RESPONSIBLE PARTY
NPL: Not Listed
Tier Of AWP Site: Not reported
Source Of Funding: C
Responsible Staff Member: Not reported
Supervisor Responsible: Not reported
SIC Code: 49
Facility SIC: ELECTRIC, GAS & SANITARY SERVICES
RWQCB Code: CV
RWQCB Associated With Site: CENTRAL VALLEY
Site Access Controlled: Uncontrolled
Site Listed HWS List: Not reported
Hazard Ranking Score: Not reported
Date Site Hazard Ranked: Not reported
Groundwater Contamination: Not reported
Of Contamination Sources: 0
Lat/Long: Not reported
Lat/Long (dms): 0 0 0 / 0 0 0
Lat/long Method: Not reported
Description Of Entity: Not reported
State Assembly Distt Code: 09
State Senate District: 06

RESPONSE:
Facility ID: 34490057
Site Type: State Response
Site Type Detail: State Response or NPL
Acres: 0.15
National Priorities List: NO
Cleanup Oversight Agencies: SMBRP, RWQCB 5S - Central Valley
Lead Agency Description: DTSC - Site Cleanup Program
Project Manager: Harold (Bud) Duke
Supervisor: Jose Salcedo
Division Branch: Northern California Schools & Santa Susana
Site Code: 100549
Site Mgmt. Req.: NONE SPECIFIED

SMUD, FRONT & T STREETS (Continued) **S101482984**

Assembly:	07
Senate:	06
Special Program Status:	Not reported
Status:	Certified O&M - Land Use Restrictions Only
Status Date:	11/01/2010
Restricted Use:	YES
Funding:	Responsible Party
Latitude:	38.57255
Longitude:	-121.5098
APN:	00900420060000
Past Use:	FUEL - VEHICLE STORAGE/ REFUELING, MANUFACTURED GAS PLANT, MANUFACTURING - LUMBER/WOOD PRODUCTS
Potential COC :	Benzene TPH-gas Ethylbenzene Polynuclear aromatic hydrocarbons (PAHs Toluene Xylenes
Confirmed COC:	Benzene Polynuclear aromatic hydrocarbons (PAHs TPH-gas Ethylbenzene Toluene Xylenes
Potential Description:	OTH, SOIL
Alias Name:	Friend & Terry Lumber Company
Alias Type:	Alternate Name
Alias Name:	Friend & Terry Lumber Company
Alias Type:	Alternate Name
Alias Name:	00900420060000
Alias Type:	APN
Alias Name:	110033609352
Alias Type:	EPA (FRS #)
Alias Name:	100549
Alias Type:	Project Code (Site Code)
Alias Name:	34490057
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Removal Action Workplan
Completed Date:	04/27/2001
Comments:	RAW - The pubilc comment period for the Draft Final Groundwater Engineering Evaluation/Cost Analysis (EE/CA) and Remedial Action Work Plan (RAW) for the Front & T Street sites, Sacramento, California for the Front Street Joint Defense Group (JDG) ended on April 3, 2001. DTSC received no comment on the above mentioned document and therefore granted final approval for said RAW. The RAW calls for a monitored natural attenuation (MNA) remedy combined with continued operation of the pump and treat system on PG&E site. A contingent remedy, which will be implemented if Site conditions change, is also funded as a part of this RAW. Implementation of this RAW is designed to meet the groundwater cleanup objectives for all of the Front & T Street sites. These sites include: 1) PG&E Sacramento- Former MGP 2) CalTrans I-5, Q Street Off-ramp 3) SHRA - 1920 Front Street and 4) SMUD - Front and T Street.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Removal Action Completion Report
Completed Date:	06/16/1999
Comments:	RA/SOIL - Excavation and removal of 18,550 metric tons of soil contaminated with PAH's and BTEX. Excavation was back filled with clean material and a soil vapor extraction system was installed to remove contaminants below the depth of excavation. The excavation was

SMUD, FRONT & T STREETS (Continued) **S101482984**

done jointly with CALTRANS.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement
Completed Date: 10/23/2007
Comments: The O&M Agreement is complete for the site. Financial assurance will be completed shortly.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 06/27/1997
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 02/01/1995
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 01/21/2009
Comments: On this date DTSC concurred with the findings of the annual LUC inspection report. The site is being used in a manner consistent with the prohibitions and limitations specified in the LUC.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction - Site Inspection/Visit
Completed Date: 10/01/2007
Comments: DTSC issued a letter which reported that the inspection revealed that the site conditions were in compliance with the LUC.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 02/24/2010
Comments: Report accepted by DTSC with the inclusion of the Front Street Well Abandonment.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 06/27/1997
Comments: CEQA -- Prepared CEQA documents for a proposed Neg. Dec. Held a 30-day public comment period on the proposed project. Received no comments, so Neg. Dec. was finalized on 6/27/97. RAW/SOIL -- Completed Neg Dec under CEQA. Approved Removal Action Workplan, which includes excavation of approximately 12,200 cu yds of contaminated soil, installation of a season soil vapor extraction system and returned the surface to its original condition. This work is to be done jointly with CalTrans who is the RP on the adjacent site.

Completed Area Name: PROJECT WIDE

SMUD, FRONT & T STREETS (Continued) **S101482984**

Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 06/16/1997
Comments: RIFS/SOIL -- Completed a RI/FS for soil for the site. SMUD is working with CalTrans, who has an adjacent site, on a joint Removal Action Workplan.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Pilot/Treatability Study Report
Completed Date: 12/11/2006
Comments: This study was submitted 20 days later than expected.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/23/2007
Comments: The draft Focused Feasibility Study was submitted on behalf of Pacific Gas and Electric Company (PG&E) for the Front and T Streets Sites. DTSC comments are scheduled to be provided by March 21, 2007.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Financial Assurance Documentation
Completed Date: 02/01/2008
Comments: Following a review by Project and Financial Assurance Unit staff, the initial deposit of $303,648.00 was verified. Four subsequent annual payments are scheduled to be made as specified in the O&M agreement. The future payments will be adjusted as specified in the agreement.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 02/01/2012
Comments: The annual Land Use Covenant report was accepted as presented on this date. The report was included with reports for the three (3) other "Front & T Street sites" (Caltrans I-5 Q Street Off-ramp, PG&E - Sacramento Site and Sacramento Housing and Redevelopment Agency).

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 01/24/2011
Comments: On this date DTSC accepted the Annual Land Use Covenant Inspection Report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 04/30/2008
Comments: Site certified in operation & maintenance on 4.30.8. A Land Use Covenant has been recorded on the property.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 11/07/2006

SMUD, FRONT & T STREETS (Continued) **S101482984**

Comments: Final Deed Restriction sent to SMUD for signature and return to the Department.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

ENVIROSTOR:
Facility ID: 34490057
Status: Certified O&M - Land Use Restrictions Only
Status Date: 11/01/2010
Site Code: 100549
Site Type: State Response
Site Type Detailed: State Response or NPL
Acres: 0.15
NPL: NO
Regulatory Agencies: SMBRP, RWQCB 5S - Central Valley
Lead Agency: SMBRP
Program Manager: Harold (Bud) Duke
Supervisor: Jose Salcedo
Division Branch: Northern California Schools & Santa Susana
Assembly: 07
Senate: 06
Special Program: Not reported
Restricted Use: YES
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.57255
Longitude: -121.5098
APN: 00900420060000
Past Use: FUEL - VEHICLE STORAGE/ REFUELING, MANUFACTURED GAS PLANT, MANUFACTURING - LUMBER/WOOD PRODUCTS
Potential COC: Benzene TPH-gas Ethylbenzene Polynuclear aromatic hydrocarbons (PAHs Toluene Xylenes
Confirmed COC: Benzene Polynuclear aromatic hydrocarbons (PAHs TPH-gas Ethylbenzene Toluene Xylenes
Potential Description: OTH, SOIL
Alias Name: Friend & Terry Lumber Company
Alias Type: Alternate Name
Alias Name: Friend & Terry Lumber Company
Alias Type: Alternate Name
Alias Name: 00900420060000
Alias Type: APN
Alias Name: 110033609352
Alias Type: EPA (FRS #)
Alias Name: 100549
Alias Type: Project Code (Site Code)
Alias Name: 34490057
Alias Type: Envirostor ID Number

Completed Info:

SMUD, FRONT & T STREETS (Continued) **S101482984**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 04/27/2001
Comments: RAW - The pubilc comment period for the Draft Final Groundwater Engineering Evaluation/Cost Analysis (EE/CA) and Remedial Action Work Plan (RAW) for the Front & T Street sites, Sacramento, California for the Front Street Joint Defense Group (JDG) ended on April 3, 2001. DTSC received no comment on the above mentioned document and therefore granted final approval for said RAW. The RAW calls for a monitored natural attenuation (MNA) remedy combined with continued operation of the pump and treat system on PG&E site. A contingent remedy, which will be implemented if Site conditions change, is also funded as a part of this RAW. Implementation of this RAW is designed to meet the groundwater cleanup objectives for all of the Front & T Street sites. These sites include: 1) PG&E Sacramento- Former MGP 2) CalTrans I-5, Q Street Off-ramp 3) SHRA - 1920 Front Street and 4) SMUD - Front and T Street.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 06/16/1999
Comments: RA/SOIL - Excavation and removal of 18,550 metric tons of soil contaminated with PAH's and BTEX. Excavation was back filled with clean material and a soil vapor extraction system was installed to remove contaminants below the depth of excavation. The excavation was done jointly with CALTRANS.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Operation & Maintenance Order/Agreement
Completed Date: 10/23/2007
Comments: The O&M Agreement is complete for the site. Financial assurance will be completed shortly.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 06/27/1997
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 02/01/1995
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 01/21/2009
Comments: On this date DTSC concurred with the findings of the annual LUC inspection report. The site is being used in a manner consistent with the prohibitions and limitations specified in the LUC.

Completed Area Name: PROJECT WIDE

SMUD, FRONT & T STREETS (Continued) **S101482984**

Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction - Site Inspection/Visit
Completed Date: 10/01/2007
Comments: DTSC issued a letter which reported that the inspection revealed that the site conditions were in compliance with the LUC.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Land Use Restriction Monitoring Report
Completed Date: 02/24/2010
Comments: Report accepted by DTSC with the inclusion of the Front Street Well Abandonment.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 06/27/1997
Comments: CEQA -- Prepared CEQA documents for a proposed Neg. Dec. Held a 30-day public comment period on the proposed project. Received no comments, so Neg. Dec. was finalized on 6/27/97. RAW/SOIL -- Completed Neg Dec under CEQA. Approved Removal Action Workplan, which includes excavation of approximately 12,200 cu yds of contaminated soil, installation of a season soil vapor extraction system and returned the surface to its original condition. This work is to be done jointly with CalTrans who is the RP on the adjacent site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 06/16/1997
Comments: RIFS/SOIL -- Completed a RI/FS for soil for the site. SMUD is working with CalTrans, who has an adjacent site, on a joint Removal Action Workplan.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Pilot/Treatability Study Report
Completed Date: 12/11/2006
Comments: This study was submitted 20 days later than expected.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/23/2007
Comments: The draft Focused Feasibility Study was submitted on behalf of Pacific Gas and Electric Company (PG&E) for the Front and T Streets Sites. DTSC comments are scheduled to be provided by March 21, 2007.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Financial Assurance Documentation
Completed Date: 02/01/2008
Comments: Following a review by Project and Financial Assurance Unit staff, the initial deposit of $303,648.00 was verified. Four subsequent annual payments are scheduled to be made as specified in the O&M agreement. The future payments will be adjusted as specified in the agreement.

SMUD, FRONT & T STREETS (Continued) **S101482984**

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	* Land Use Restriction Monitoring Report
Completed Date:	02/01/2012
Comments:	The annual Land Use Covenant report was accepted as presented on this date. The report was included with reports for the three (3) other "Front & T Street sites" (Caltrans I-5 Q Street Off-ramp, PG&E - Sacramento Site and Sacramento Housing and Redevelopment Agency).
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	* Land Use Restriction Monitoring Report
Completed Date:	01/24/2011
Comments:	On this date DTSC accepted the Annual Land Use Covenant Inspection Report.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Certification
Completed Date:	04/30/2008
Comments:	Site certified in operation & maintenance on 4.30.8. A Land Use Covenant has been recorded on the property.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Land Use Restriction
Completed Date:	11/07/2006
Comments:	Final Deed Restriction sent to SMUD for signature and return to the Department.
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

321
East
1/2-1
0.927 mi.
4895 ft.

SIMS METAL SITE **CA Cortese** **S107737346**
130 NORTH 12 STREET; AT INTERSECTION OF NORTH B STREETS **CA RESPONSE** **N/A**
SACRAMENTO, CA 95814 **CA ENVIROSTOR**

Relative:
Higher

Actual:
27 ft.

CORTESE:

Region:	CORTESE
Envirostor Id:	70000019
Site/Facility Type:	STATE RESPONSE
Cleanup Status:	ACTIVE
Status Date:	10/30/2004
Site Code:	101762
Latitude:	38.590306
Longitude:	-121.48768
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported

SIMS METAL SITE (Continued) **S107737346**

Flag:	envirostor
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported

RESPONSE:

Facility ID:	70000019
Site Type:	State Response
Site Type Detail:	State Response or NPL
Acres:	8.8
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP, RWQCB 5R - Central Valley
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Duane White
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Site Code:	101762
Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	07
Senate:	06
Special Program Status:	Not reported
Status:	Active
Status Date:	10/30/2004
Restricted Use:	NO
Funding:	Responsible Party
Latitude:	38.59030
Longitude:	-121.4876
APN:	002-001-035-0000, 002-031-001-0000, 002-031-002-0000, 00200310020000
Past Use:	RECYCLING - SCRAP METAL
Potential COC :	Lead Methyl tertbutyl ether (MTBE TPH-MOTOR OIL Vinyl chloride Copper and compounds 1,2-Dichloroethylene (cis PCBs (unspeciated mixture, high risk, e.g. Aroclor 1254
Confirmed COC:	NONE SPECIFIED
Potential Description:	OTH, SOIL
Alias Name:	Levin Metals
Alias Type:	Alternate Name
Alias Name:	Levine Metals
Alias Type:	Alternate Name
Alias Name:	002-001-035-0000
Alias Type:	APN
Alias Name:	002-031-001-0000
Alias Type:	APN
Alias Name:	002-031-002-0000
Alias Type:	APN
Alias Name:	00200310020000
Alias Type:	APN
Alias Name:	CASFN0905470
Alias Type:	EPA Identification Number
Alias Name:	110033609272
Alias Type:	EPA (FRS #)
Alias Name:	T10000000891
Alias Type:	GeoTracker Global ID
Alias Name:	101762

SIMS METAL SITE (Continued) **S107737346**

Alias Type: Project Code (Site Code)
Alias Name: 70000019
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consent Order
Completed Date: 09/19/2005
Comments: Final Consent order issued to three responsible parties, including Sims Metal, Levin Metals and SAG/WIG, LLC A consent order has been issued for RPs to perform an RI, Risk Assessment and a Feasibility Study (FS) on Study Area #1 and a Site Investigation on Study Area # 2.

Completed Area Name: Area 1
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 01/20/2013
Comments: DTSC received the 2012 4th quarter Summary Report. DTSC reviewed the Fesibility Report and provide comments.

Completed Area Name: Area 2
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 01/20/2013
Comments: DTSC is reviewing the Remedial INvestigation Report and preparing a Land Use Covenant.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 09/20/2005
Comments: Remedial Action Order issued September 21, 2005 to UPRR for cooperation and participation with the UP-Sims Consent Order.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 02/01/1999
Comments: Not reported

Completed Area Name: Area 1
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 05/23/2006
Comments: Letter approving RI/FS workplan for Study Area 1 completed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 05/24/2006
Comments: Public Participation Plan approved by N. Schumacher PPS.

Completed Area Name: Area 1
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Report
Completed Date: 11/17/2008

SIMS METAL SITE (Continued) **S107737346**

Comments: The Department has determined that data collected under various sampling events including Phase II Investigation are sufficient to characterize the contamination in Study Area #1. RI Field Activities have been completed. SIMS will proceed with preparation of the RI Report (due: mid-February 09)

Completed Area Name: Area 2
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 08/26/2009
Comments: Not reported

Completed Area Name: Area 1
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 10/22/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 08/09/2006
Comments: DTSC completed a reassessment for USEPA under the PA/SI grant.

Completed Area Name: Area 1
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Report
Completed Date: 04/01/2009
Comments: Not reported

Completed Area Name: Area 2
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 11/29/2010
Comments: Not reported

Future Area Name: Area 1
Future Sub Area Name: Not reported
Future Document Type: Land Use Restriction
Future Due Date: 2015
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

ENVIROSTOR:
Facility ID: 70000019
Status: Active
Status Date: 10/30/2004
Site Code: 101762
Site Type: State Response
Site Type Detailed: State Response or NPL
Acres: 8.8
NPL: NO
Regulatory Agencies: SMBRP, RWQCB 5R - Central Valley
Lead Agency: SMBRP

SIMS METAL SITE (Continued) **S107737346**

Program Manager:	Duane White
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Responsible Party
Latitude:	38.59030
Longitude:	-121.4876
APN:	002-001-035-0000, 002-031-001-0000, 002-031-002-0000, 00200310020000
Past Use:	RECYCLING - SCRAP METAL
Potential COC:	Lead Methyl tertbutyl ether (MTBE TPH-MOTOR OIL Vinyl chloride Copper and compounds 1,2-Dichloroethylene (cis PCBs (unspeciated mixture, high risk, e.g. Aroclor 1254
Confirmed COC:	NONE SPECIFIED
Potential Description:	OTH, SOIL
Alias Name:	Levin Metals
Alias Type:	Alternate Name
Alias Name:	Levine Metals
Alias Type:	Alternate Name
Alias Name:	002-001-035-0000
Alias Type:	APN
Alias Name:	002-031-001-0000
Alias Type:	APN
Alias Name:	002-031-002-0000
Alias Type:	APN
Alias Name:	00200310020000
Alias Type:	APN
Alias Name:	CASFN0905470
Alias Type:	EPA Identification Number
Alias Name:	110033609272
Alias Type:	EPA (FRS #)
Alias Name:	T10000000891
Alias Type:	GeoTracker Global ID
Alias Name:	101762
Alias Type:	Project Code (Site Code)
Alias Name:	70000019
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Consent Order
Completed Date:	09/19/2005
Comments:	Final Consent order issued to three responsible parties, including Sims Metal, Levin Metals and SAG/WIG, LLC A consent order has been issued for RPs to perform an RI, Risk Assessment and a Feasibility Study (FS) on Study Area #1 and a Site Investigation on Study Area # 2.
Completed Area Name:	Area 1
Completed Sub Area Name:	Not reported
Completed Document Type:	Correspondence
Completed Date:	01/20/2013
Comments:	DTSC received the 2012 4th quarter Summary Report. DTSC reviewed the Fesibility Report and provide comments.

SIMS METAL SITE (Continued) **S107737346**

Completed Area Name: Area 2
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 01/20/2013
Comments: DTSC is reviewing the Remedial INvestigation Report and preparing a Land Use Covenant.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Unilateral Order (I/SE, RAO, CAO, EPA AO)
Completed Date: 09/20/2005
Comments: Remedial Action Order issued September 21, 2005 to UPRR for cooperation and participation with the UP-Sims Consent Order.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 02/01/1999
Comments: Not reported

Completed Area Name: Area 1
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 05/23/2006
Comments: Letter approving RI/FS workplan for Study Area 1 completed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 05/24/2006
Comments: Public Participation Plan approved by N. Schumacher PPS.

Completed Area Name: Area 1
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Report
Completed Date: 11/17/2008
Comments: The Department has determined that data collected under various sampling events including Phase II Investigation are sufficient to characterize the contamination in Study Area #1. RI Field Activities have been completed. SIMS will proceed with preparation of the RI Report (due: mid-February 09)

Completed Area Name: Area 2
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 08/26/2009
Comments: Not reported

Completed Area Name: Area 1
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 10/22/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening

SIMS METAL SITE (Continued) **S107737346**

Completed Date:	08/09/2006
Comments:	DTSC completed a reassessment for USEPA under the PA/SI grant.
Completed Area Name:	Area 1
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Investigation Report
Completed Date:	04/01/2009
Comments:	Not reported
Completed Area Name:	Area 2
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Characterization Report
Completed Date:	11/29/2010
Comments:	Not reported
Future Area Name:	Area 1
Future Sub Area Name:	Not reported
Future Document Type:	Land Use Restriction
Future Due Date:	2015
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

BD322 **THE DOCKS AREA SACRAMENTO EOA** **CA VCP** **S108054409**
South **CITY OF SACRAMENTO RIVERFRONT** **CA ENVIROSTOR** **N/A**
1/2-1 **SACRAMENTO, CA 95204**
0.935 mi.
4936 ft. **Site 2 of 2 in cluster BD**

Relative:
Higher

Actual:
22 ft.

VCP:

Facility ID:	60000357
Site Type:	Voluntary Cleanup
Site Type Detail:	Voluntary Cleanup
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	20
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP, SACRAMENTO COUNTY
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Maria Gillette
Supervisor:	Steven Becker
Division Branch:	Cleanup Sacramento
Site Code:	101744
Assembly:	07
Senate:	06
Special Programs Code:	Polanco Redevelopment MOA
Status:	No Further Action
Status Date:	03/09/2010
Restricted Use:	NO
Funding:	Responsible Party
Lat/Long:	38.57222 / -121.5102
APN:	NONE SPECIFIED
Past Use:	MANUFACTURED GAS PLANT, PORT, RAILROAD RIGHT OF WAY, UNKNOWN, TRANSPORTATION - WAREHOUSING
Potential COC:	31001
Confirmed COC:	31001

THE DOCKS AREA SACRAMENTO EOA (Continued) **S108054409**

Potential Description: OTH, SED, SOIL
Alias Name: 110033606257
Alias Type: EPA (FRS #)
Alias Name: 101744
Alias Type: Project Code (Site Code)
Alias Name: 60000357
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 07/31/2007
Comments: The Environmental Oversight Agreement (EOA) between DTSC and the Redevelopment Agency of the City of Sacramento (RDA) was finalized on 6/22/2006.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 12/02/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 12/01/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 09/25/2008
Comments: Letter on Draft EIR provided.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

ENVIROSTOR:
Facility ID: 60000357
Status: No Further Action
Status Date: 03/09/2010
Site Code: 101744
Site Type: Voluntary Cleanup
Site Type Detailed: Voluntary Cleanup
Acres: 20
NPL: NO
Regulatory Agencies: SMBRP, SACRAMENTO COUNTY
Lead Agency: SMBRP
Program Manager: Maria Gillette

THE DOCKS AREA SACRAMENTO EOA (Continued) **S108054409**

Supervisor: Steven Becker
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Polanco Redevelopment MOA
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.57222
Longitude: -121.5102
APN: NONE SPECIFIED
Past Use: MANUFACTURED GAS PLANT, PORT, RAILROAD RIGHT OF WAY, UNKNOWN, TRANSPORTATION - WAREHOUSING
Potential COC: Under Investigation
Confirmed COC: Under Investigation
Potential Description: OTH, SED, SOIL
Alias Name: 110033606257
Alias Type: EPA (FRS #)
Alias Name: 101744
Alias Type: Project Code (Site Code)
Alias Name: 60000357
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 07/31/2007
Comments: The Environmental Oversight Agreement (EOA) between DTSC and the Redevelopment Agency of the City of Sacramento (RDA) was finalized on 6/22/2006.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 12/02/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 12/01/2009
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 09/25/2008
Comments: Letter on Draft EIR provided.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported

THE DOCKS AREA SACRAMENTO EOA (Continued) **S108054409**

Schedule Revised Date: Not reported

323
NE
1/2-1
0.939 mi.
4959 ft.

SACRAMENTO SIGNAL DEPOT (J09CA0924) **CA ENVIROSTOR** **S109149607**
NORTH 7TH STREET **N/A**
SACRAMENTO, CA 95814

Relative:
Higher

Actual:
27 ft.

ENVIROSTOR:

Facility ID:	80000605
Status:	No Further Action
Status Date:	04/28/2010
Site Code:	Not reported
Site Type:	Military Evaluation
Site Type Detailed:	FUDS
Acres:	47
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Carrie Tatoian-Cain
Supervisor:	Charles Ridenour
Division Branch:	Cleanup Sacramento
Assembly:	07
Senate:	06
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	DERA
Latitude:	38.60083
Longitude:	-121.4891
APN:	NONE SPECIFIED
Past Use:	VEHICLE MAINTENANCE
Potential COC:	TPH-diesel TPH-gas
Confirmed COC:	30024-NO 30025-NO
Potential Description:	UE
Alias Name:	Sacramento Army Depot
Alias Type:	Alternate Name
Alias Name:	CA99799F584400
Alias Type:	Federal Facility ID
Alias Name:	J09CA0924
Alias Type:	INPR
Alias Name:	80000605
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	No Department of Defense Action Indicated (NDAI)
Completed Date:	06/27/2008
Comments:	DTSC did not concur on the NDAI. DTSC is requesting more information about the possibilty of Underground Storage Tanks.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	No Department of Defense Action Indicated (NDAI)
Completed Date:	04/08/2010
Comments:	The ACOE submitted responses to DTSC's comments on the original NDAI. The responses resolved our concerns regarding this FUD site. If

SACRAMENTO SIGNAL DEPOT (J09CA0924) (Continued) **S109149607**

further information arises regarding the environmental condition of this FUD site DTSC will reopen an investigation.

Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

324
SSE
1/2-1
0.971 mi.
5125 ft.

CADA WAREHOUSE REDEVELOPMENT PROJECT **CA VCP** **S108744087**
1108 R STREET **CA Sacramento Co. ML** **N/A**
SACRAMENTO, CA 95814 **CA HAZNET**
CA ENVIROSTOR

Relative:
Higher

Actual:
19 ft.

VCP:

Facility ID:	34390001
Site Type:	Voluntary Cleanup
Site Type Detail:	Voluntary Cleanup
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	2.7
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Duane White
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Site Code:	101101
Assembly:	07
Senate:	06
Special Programs Code:	Voluntary Cleanup Program
Status:	Certified
Status Date:	08/25/2004
Restricted Use:	NO
Funding:	Responsible Party
Lat/Long:	38.57074 / -121.4955
APN:	00900750010000
Past Use:	OFFICE BUILDING
Potential COC:	30019, 30024, 3002502
Confirmed COC:	30019,30024,3002502
Potential Description:	SOIL
Alias Name:	CADA WAREHOUSE REDEVELOPMENT PROJECT
Alias Type:	Alternate Name
Alias Name:	00900750010000
Alias Type:	APN
Alias Name:	110033617272
Alias Type:	EPA (FRS #)
Alias Name:	101101
Alias Type:	Project Code (Site Code)
Alias Name:	34390001
Alias Type:	Envirostor ID Number

Completed Info:

CADA WAREHOUSE REDEVELOPMENT PROJECT (Continued) **S108744087**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 11/21/2001
Comments: RAW/CEQA - A public comment period for the Removal Action Workplan (RAW) and Notice of Exemption (NOE) was held for 30 days beginning September 25, 2001 and ending on October 25, 2001. During the comment period, DTSC only received one written comment. DTSC has responded to the comment and has approved the RAW and NOE. Approximately 645 cubic yards of soil will be removed and transported to a landfill. DTSC anticipates excavation to be completed by April 2002.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 05/04/2001
Comments: RI/FS - THE RI/FS HAS BEEN APPROVED AND A COPY OF THE APPROVAL LETTER HAS BEEN ATTACHED. CADA WILL BE SUBMITTING A REMEDIAL ACTION WORKPLAN TO DTSC FOR REVIEW.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 08/25/2004
Comments: RA (REMEDIAL ACTION) -- THE DEPARTMENT OF TOXIC SUBSTANCES CONTROL (DTSC) APPROVED THE 2004 CONSTRUCTION REPORT FOR THE CADA WAREHOUSE REDEVELOPMENT PROJECT. REMEDIATION ACTIVITIES OCCURRED IN THE SUMMER OF 2002 AND BETWEEN MAY AND JUNE IN 2004. THE REPORT DOCUMENTS THE REMEDIATION EXCAVATION ACTIVITIES THAT TOOK PLACE IN 2004. APPROXIMATELY 5000 CUBIC YARDS OF MATERIAL WAS EXCAVATED AND TRANSPORTED TO A CLASS II DISPOSAL FACILITY. AFTER COMPLETION OF THE EXCAVATION AND DISPOSAL ACTIVITIES, SEVERAL CONFIRMATION SAMPLES WERE COLLECTED FROM REMAINING SOIL ON THE PROPERTY. ANALYTICAL RESULTS INDICATE NO CONTAMINATION WERE ABOVE THE CONCENTRATION OF CONCERN ESTABLISHED BY THE HUMAN HEALTH RISK ASSESSMENT AT THE SITE.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 08/03/2002
Comments: DTSC received the Design Implementation Work Plan.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 05/17/2002
Comments: DTSC received a Contract with Remediation Contractor from CADA.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Workplan
Completed Date: 04/25/1999
Comments: DTSC approved the Sample Analysis Plan.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report

CADA WAREHOUSE REDEVELOPMENT PROJECT (Continued) **S108744087**

Completed Date: 02/18/2001
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 08/28/2001
Comments: DTSC approved a Community Relations Plan.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 02/18/2001
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 11/21/2001
Comments: DTSC has determined this project is exemt from the California Environmental Quality Act.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 08/25/2004
Comments: CERT (CERTIFICATION) -- CADA REMOVED APPROXIMATELY 5,000 CUBIC YARDS OF POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) CONTAMINATED SOIL AND TRANSPORT IT TO A CLASS II FACILITY. ANALYTICAL RESULTS INDICATE NO CONTAMINATION ABOVE THE CONCENTRATION OF CONCERN ESTABLISHED BY THE HUMAN HEALTH RISK ASSESSMENT. THE SITE HAS BEEN CERTIFIED FOR UNRESTRICTED LAND USE. STARTING IN 2004/2005 SEVERAL LOFT STYLE APARTMENT AND A PARKING GARAGE WILL BE CONSTRUCTED.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 02/03/1999
Comments: ORDER/VCA -- DTSC AND THE CAPITOL AREA REDEVELOPMENT AUTHORITY (CADA) HAVE ENTERED INTO A VOLUNTARY CLEANUP AGREEMENT (VCA) FOR THE PROPONENT TO COMPLETE A PRELIMINARY ENDANGERMENT ASSESSEMENT (PEA) UNDER THE OVERSIGHT OF DTSC FOR THE CADA WAREHOUSE DEVELOPMENT PROJECT LOCATED AT 11TH AND R STREETS IN SACRAMENTO CALIFORNIA.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

Sacramento Co. ML:
Facility Id: Not reported
Facility Status: Inactive. Included on a listing no longer updated.

CADA WAREHOUSE REDEVELOPMENT PROJECT (Continued) **S108744087**

FD:	U
Billing Codes BP:	Disclaimer
Billing Codes UST:	No Tanks
WG Bill Code:	Oil Changed by Outside Company-No Fee
Target Property Bill Cod:	50
Food Bill Code:	50
CUPA Permit Date:	Not reported
HAZMAT Permit Date:	Not reported
HAZMAT Inspection Date:	Not reported
Hazmat Date BP Received:	Not reported
UST Permit Dt:	Not reported
UST Inspection Date:	Not reported
UST Tank Test Date:	Not reported
Number of Tanks:	0
UST Tank Test Date:	Not reported
SIC Code:	Not reported
Tier Permitting:	Not reported
AST Bill Code:	Not reported
CALARP Bill Code:	Not reported

HAZNET:

envid:	S108744087
Year:	2013
GEPAID:	CAC002722675
Contact:	DINO BARTEVIAN
Telephone:	9162405753
Mailing Name:	Not reported
Mailing Address:	1006 4TH ST
Mailing City,St,Zip:	SACRAMENTO, CA 958143314
Gen County:	Sacramento
TSD EPA ID:	CAD982042475
TSD County:	Solano
Waste Category:	Not reported
Disposal Method:	Landfill Or Surface Impoundment That Will Be Closed As Landfill(To Include On-Site Treatment And/Or Stabilization)
Tons:	Not reported
Facility County:	Not reported

envid:	S108744087
Year:	2013
GEPAID:	CAC002722675
Contact:	DINO BARTEVIAN
Telephone:	9162405753
Mailing Name:	Not reported
Mailing Address:	1006 4TH ST
Mailing City,St,Zip:	SACRAMENTO, CA 958143314
Gen County:	Sacramento
TSD EPA ID:	CAD982042475
TSD County:	Solano
Waste Category:	Not reported
Disposal Method:	Not reported
Tons:	4
Facility County:	Not reported

ENVIROSTOR:

Facility ID:	34390001

CADA WAREHOUSE REDEVELOPMENT PROJECT (Continued) **S108744087**

Status: Certified
Status Date: 08/25/2004
Site Code: 101101
Site Type: Voluntary Cleanup
Site Type Detailed: Voluntary Cleanup
Acres: 2.7
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Duane White
Supervisor: Fernando A. Amador
Division Branch: Cleanup Sacramento
Assembly: 07
Senate: 06
Special Program: Voluntary Cleanup Program
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 38.57074
Longitude: -121.4955
APN: 00900750010000
Past Use: OFFICE BUILDING
Potential COC: Polynuclear aromatic hydrocarbons (PAHs TPH-diesel TPH-MOTOR OIL
Confirmed COC: Polynuclear aromatic hydrocarbons (PAHs TPH-diesel TPH-MOTOR OIL
Potential Description: SOIL
Alias Name: CADA WAREHOUSE REDEVELOPMENT PROJECT
Alias Type: Alternate Name
Alias Name: 00900750010000
Alias Type: APN
Alias Name: 110033617272
Alias Type: EPA (FRS #)
Alias Name: 101101
Alias Type: Project Code (Site Code)
Alias Name: 34390001
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 11/21/2001
Comments: RAW/CEQA - A public comment period for the Removal Action Workplan (RAW) and Notice of Exemption (NOE) was held for 30 days beginning September 25, 2001 and ending on October 25, 2001. During the comment period, DTSC only received one written comment. DTSC has responded to the comment and has approved the RAW and NOE. Approximately 645 cubic yards of soil will be removed and transported to a landfill. DTSC anticipates excavation to be completed by April 2002.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 05/04/2001
Comments: RI/FS - THE RI/FS HAS BEEN APPROVED AND A COPY OF THE APPROVAL LETTER HAS BEEN ATTACHED. CADA WILL BE SUBMITTING A REMEDIAL ACTION WORKPLAN TO DTSC FOR REVIEW.

Completed Area Name: PROJECT WIDE

CADA WAREHOUSE REDEVELOPMENT PROJECT (Continued) **S108744087**

Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 08/25/2004
Comments: RA (REMEDIAL ACTION) -- THE DEPARTMENT OF TOXIC SUBSTANCES CONTROL (DTSC) APPROVED THE 2004 CONSTRUCTION REPORT FOR THE CADA WAREHOUSE REDEVELOPMENT PROJECT. REMEDIATION ACTIVITIES OCCURRED IN THE SUMMER OF 2002 AND BETWEEN MAY AND JUNE IN 2004. THE REPORT DOCUMENTS THE REMEDIATION EXCAVATION ACTIVITIES THAT TOOK PLACE IN 2004. APPROXIMATELY 5000 CUBIC YARDS OF MATERIAL WAS EXCAVATED AND TRANSPORTED TO A CLASS II DISPOSAL FACILITY. AFTER COMPLETION OF THE EXCAVATION AND DISPOSAL ACTIVITIES, SEVERAL CONFIRMATION SAMPLES WERE COLLECTED FROM REMAINING SOIL ON THE PROPERTY. ANALYTICAL RESULTS INDICATE NO CONTAMINATION WERE ABOVE THE CONCENTRATION OF CONCERN ESTABLISHED BY THE HUMAN HEALTH RISK ASSESSMENT AT THE SITE.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 08/03/2002
Comments: DTSC received the Design Implementation Work Plan.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: *Correspondence - Received
Completed Date: 05/17/2002
Comments: DTSC received a Contract with Remediation Contractor from CADA.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Workplan
Completed Date: 04/25/1999
Comments: DTSC approved the Sample Analysis Plan.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 02/18/2001
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 08/28/2001
Comments: DTSC approved a Community Relations Plan.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 02/18/2001
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Notice of Exemption
Completed Date: 11/21/2001
Comments: DTSC has determined this project is exemt from the California Environmental Quality Act.

CADA WAREHOUSE REDEVELOPMENT PROJECT (Continued) **S108744087**

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Certification
Completed Date:	08/25/2004
Comments:	CERT (CERTIFICATION) -- CADA REMOVED APPROXIMATELY 5,000 CUBIC YARDS OF POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) CONTAMINATED SOIL AND TRANSPORT IT TO A CLASS II FACILITY. ANALYTICAL RESULTS INDICATE NO CONTAMINATION ABOVE THE CONCENTRATION OF CONCERN ESTABLISHED BY THE HUMAN HEALTH RISK ASSESSMENT. THE SITE HAS BEEN CERTIFIED FOR UNRESTRICTED LAND USE. STARTING IN 2004/2005 SEVERAL LOFT STYLE APARTMENT AND A PARKING GARAGE WILL BE CONSTRUCTED.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Voluntary Cleanup Agreement
Completed Date:	02/03/1999
Comments:	ORDER/VCA -- DTSC AND THE CAPITOL AREA REDEVELOPMENT AUTHORITY (CADA) HAVE ENTERED INTO A VOLUNTARY CLEANUP AGREEMENT (VCA) FOR THE PROPONENT TO COMPLETE A PRELIMINARY ENDANGERMENT ASSESSEMENT (PEA) UNDER THE OVERSIGHT OF DTSC FOR THE CADA WAREHOUSE DEVELOPMENT PROJECT LOCATED AT 11TH AND R STREETS IN SACRAMENTO CALIFORNIA.

Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

325
SSW
1/2-1
0.996 mi.
5257 ft.

PACIFIC GAS AND ELECTRIC CO
101 U STREET
SACRAMENTO, CA 95818

EDR MGP **1008407744**
N/A

Relative:
Higher

Actual:
22 ft.

Manufactured Gas Plants:
No additional information available

Count: 15 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
SACRAMENTO	1003878554	SMUD NORTH CITY SUBSTA	20TH & N B STS	95814	CERC-NFRAP
SACRAMENTO	S117038677	SACRAMENTO DOWNTOWN ARENA	AREA BOUNDED BY 3RD, 7TH, J AN	95814	CA VCP, CA ENVIROSTOR
SACRAMENTO	S106230361	MCCLELLAN AIR FORCE BASE (CLOSING	5241 ARNID AVE, 10 MILES NORTH		CA SLIC
SACRAMENTO	S106782284	CITY OF SACRAMENTO	I-5 AT SAN JUAN AVE		CA Sacramento Co. CS
SACRAMENTO	S106230377	SHRA I -5 SITES	30 FRONT ST		CA SLIC
SACRAMENTO	S103678765	CALTRANS FRONT & "T" ST	FRONT & T STS		CA SLIC
SACRAMENTO	1003878908	PG&E GAS PLANT SACRAMENTO 206 2	FRONT & T STS	95818	CERC-NFRAP
SACRAMENTO	S106230378	SACRAMENTO HOUSING & REDEVELOPMENT	401 FRONT ST (1920) & T ST		CA SLIC
SACRAMENTO	S105245830	METRO BURN PIT	SACRAMENTO METRO AIRPO		CA Sacramento Co. CS
SACRAMENTO	S104970714	PRICE CO/DWR - RETENTION POND	E STOCKTON BLVD		CA Sacramento Co. CS
SACRAMENTO	S108996995	LOT X CITY OF SACRAMENTO DEVELOPME	0 N STREET		CA LUST
WEST SACRAMENTO	S107138462	TEXACO SERVICE STATION (FORMER)	WEST CAPITOL & THIRD STREET	95691	CA LUST
WEST SACRAMENTO	S106230598	VOPAK USA INC. (FORMER VAN WATERS	850 RIVER RD S & 400 BALLPARK		CA SLIC
WEST SACRAMENTO	S105556828	CAPITAL PLATING FACILITY (FORMER)*	WEST SACRAMENTO		CA SLIC
WEST SACRAMENTO	1016349850	427 C STREET & 317 5TH STREET	427 C STREET & 317 5TH STREET	95691	US BROWNFIELDS, FINDS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 12/16/2014
Date Data Arrived at EDR: 01/08/2015
Date Made Active in Reports: 02/09/2015
Number of Days to Update: 32

Source: EPA
Telephone: N/A
Last EDR Contact: 04/08/2015
Next Scheduled EDR Contact: 07/20/2015
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 12/16/2014
Date Data Arrived at EDR: 01/08/2015
Date Made Active in Reports: 02/09/2015
Number of Days to Update: 32

Source: EPA
Telephone: N/A
Last EDR Contact: 04/08/2015
Next Scheduled EDR Contact: 07/20/2015
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 12/16/2014
Date Data Arrived at EDR: 01/08/2015
Date Made Active in Reports: 02/09/2015
Number of Days to Update: 32

Source: EPA
Telephone: N/A
Last EDR Contact: 04/08/2015
Next Scheduled EDR Contact: 07/20/2015
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 04/02/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 07/21/2014
Date Data Arrived at EDR: 10/07/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 04/08/2015
Next Scheduled EDR Contact: 07/20/2015
Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 04/02/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/09/2014
Date Data Arrived at EDR: 12/29/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 31

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/31/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/09/2014
Date Data Arrived at EDR: 12/29/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/31/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/09/2014
Date Data Arrived at EDR: 12/29/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/31/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/09/2014
Date Data Arrived at EDR: 12/29/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/31/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/09/2014
Date Data Arrived at EDR: 12/29/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/31/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 09/18/2014
Date Data Arrived at EDR: 09/19/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/26/2015
Next Scheduled EDR Contact: 06/15/2015
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 09/18/2014
Date Data Arrived at EDR: 09/19/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/26/2015
Next Scheduled EDR Contact: 06/15/2015
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/03/2014
Date Data Arrived at EDR: 12/12/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 48

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/16/2015
Next Scheduled EDR Contact: 06/01/2015
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/29/2014
Date Data Arrived at EDR: 09/30/2014
Date Made Active in Reports: 11/06/2014
Number of Days to Update: 37

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 03/31/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Annually

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 03/11/2015
Date Data Arrived at EDR: 03/12/2015
Date Made Active in Reports: 03/18/2015
Number of Days to Update: 6

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 03/12/2015
Next Scheduled EDR Contact: 05/18/2015
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 03/11/2015
Date Data Arrived at EDR: 03/12/2015
Date Made Active in Reports: 03/18/2015
Number of Days to Update: 6

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 03/12/2015
Next Scheduled EDR Contact: 05/18/2015
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 02/16/2015
Date Data Arrived at EDR: 02/17/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 14

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 02/17/2015
Next Scheduled EDR Contact: 06/01/2015
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST: Geotracker's Leaking Underground Fuel Tank Report

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 03/13/2015
Date Data Arrived at EDR: 03/18/2015
Date Made Active in Reports: 03/24/2015
Number of Days to Update: 6

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 03/18/2015
Next Scheduled EDR Contact: 06/29/2015
Data Release Frequency: Quarterly

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

SLIC: Statewide SLIC Cases

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 03/13/2015
Date Data Arrived at EDR: 03/18/2015
Date Made Active in Reports: 03/24/2015
Number of Days to Update: 6

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/18/2015
Next Scheduled EDR Contact: 06/29/2015
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 02/03/2015
Date Data Arrived at EDR: 02/12/2015
Date Made Active in Reports: 03/13/2015
Number of Days to Update: 29

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 01/08/2015
Date Data Arrived at EDR: 01/08/2015
Date Made Active in Reports: 02/09/2015
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/08/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Quarterly

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 01/28/2015
Date Data Arrived at EDR: 01/30/2015
Date Made Active in Reports: 03/13/2015
Number of Days to Update: 42

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 09/23/2014
Date Data Arrived at EDR: 11/25/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 65

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 01/23/2015
Date Data Arrived at EDR: 02/10/2015
Date Made Active in Reports: 03/13/2015
Number of Days to Update: 31

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 09/30/2014
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/13/2015
Number of Days to Update: 10

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Semi-Annually

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 01/30/2015
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 32
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 184
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/30/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

State and tribal registered storage tank lists

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 03/13/2015
Date Data Arrived at EDR: 03/18/2015
Date Made Active in Reports: 03/26/2015
Number of Days to Update: 8
Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 03/18/2015
Next Scheduled EDR Contact: 06/29/2015
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 08/01/2009
Date Data Arrived at EDR: 09/10/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 21
Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 07/13/2015
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Quarterly

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 01/23/2015
Date Data Arrived at EDR: 02/13/2015
Date Made Active in Reports: 03/13/2015
Number of Days to Update: 28
Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/23/2014
Date Data Arrived at EDR: 11/25/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 65
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 01/29/2015
Date Data Arrived at EDR: 01/30/2015
Date Made Active in Reports: 03/13/2015
Number of Days to Update: 42

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 12/14/2014
Date Data Arrived at EDR: 02/13/2015
Date Made Active in Reports: 03/13/2015
Number of Days to Update: 28

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 01/27/2014
Number of Days to Update: 271

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/30/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 01/30/2015
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/13/2015
Number of Days to Update: 36

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 09/30/2014
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/13/2015
Number of Days to Update: 10

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Semi-Annually

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 02/03/2015
Date Data Arrived at EDR: 02/12/2015
Date Made Active in Reports: 03/13/2015
Number of Days to Update: 29

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Quarterly

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 04/13/2015
Next Scheduled EDR Contact: 07/27/2015
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/29/2014
Date Data Arrived at EDR: 10/01/2014
Date Made Active in Reports: 11/06/2014
Number of Days to Update: 36

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 04/02/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 03/11/2015
Date Data Arrived at EDR: 03/12/2015
Date Made Active in Reports: 03/18/2015
Number of Days to Update: 6

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 03/12/2015
Next Scheduled EDR Contact: 05/18/2015
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/22/2014
Date Data Arrived at EDR: 12/22/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 38

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/24/2015
Next Scheduled EDR Contact: 07/06/2015
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137
Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 03/16/2015
Date Data Arrived at EDR: 03/18/2015
Date Made Active in Reports: 03/26/2015
Number of Days to Update: 8
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 03/18/2015
Next Scheduled EDR Contact: 06/29/2015
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 04/04/2015
Date Data Arrived at EDR: 04/07/2015
Date Made Active in Reports: 04/13/2015
Number of Days to Update: 6
Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 02/16/2015
Next Scheduled EDR Contact: 06/01/2015
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52
Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 02/02/2015
Next Scheduled EDR Contact: 05/18/2015
Data Release Frequency: Varies

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30
Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 02/09/2015
Next Scheduled EDR Contact: 05/25/2015
Data Release Frequency: No Update Planned

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 02/25/2015
Date Data Arrived at EDR: 03/10/2015
Date Made Active in Reports: 03/25/2015
Number of Days to Update: 15

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/03/2015
Next Scheduled EDR Contact: 06/15/2015
Data Release Frequency: Quarterly

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 03/11/2015
Date Data Arrived at EDR: 03/12/2015
Date Made Active in Reports: 03/18/2015
Number of Days to Update: 6

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 03/12/2015
Next Scheduled EDR Contact: 05/18/2015
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 03/10/2015
Date Made Active in Reports: 03/18/2015
Number of Days to Update: 8

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 04/13/2015
Next Scheduled EDR Contact: 07/27/2015
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 02/25/2015
Date Data Arrived at EDR: 03/10/2015
Date Made Active in Reports: 03/25/2015
Number of Days to Update: 15

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/03/2015
Next Scheduled EDR Contact: 06/15/2015
Data Release Frequency: No Update Planned

Local Lists of Registered Storage Tanks

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/23/2009
Date Data Arrived at EDR: 09/23/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 02/26/2015
Next Scheduled EDR Contact: 06/15/2015
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/18/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 01/30/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 03/11/2015
Date Data Arrived at EDR: 03/13/2015
Date Made Active in Reports: 03/24/2015
Number of Days to Update: 11

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 03/09/2015
Next Scheduled EDR Contact: 06/22/2015
Data Release Frequency: Varies

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 03/09/2015
Date Data Arrived at EDR: 03/10/2015
Date Made Active in Reports: 03/18/2015
Number of Days to Update: 8

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 03/10/2015
Next Scheduled EDR Contact: 06/22/2015
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/29/2014
Date Data Arrived at EDR: 12/30/2014
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 69

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/31/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Annually

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 01/21/2015
Date Data Arrived at EDR: 01/28/2015
Date Made Active in Reports: 02/26/2015
Number of Days to Update: 29

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 01/28/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing

The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units.

Date of Government Version: 03/13/2015
Date Data Arrived at EDR: 03/18/2015
Date Made Active in Reports: 03/24/2015
Number of Days to Update: 6

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/18/2015
Next Scheduled EDR Contact: 06/29/2015
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing

The State Water Resources Control Board and nine Regional Water Quality Control Boards partner with the Department of Defense (DoD) through the Defense and State Memorandum of Agreement (DSMOA) to oversee the investigation and remediation of water quality issues at military facilities.

Date of Government Version: 03/13/2015
Date Data Arrived at EDR: 03/18/2015
Date Made Active in Reports: 03/24/2015
Number of Days to Update: 6

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/18/2015
Next Scheduled EDR Contact: 06/29/2015
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/09/2014
Date Data Arrived at EDR: 12/29/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/31/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 02/03/2015
Next Scheduled EDR Contact: 05/18/2015
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/14/2015
Next Scheduled EDR Contact: 07/27/2015
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 06/06/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 09/18/2014
Number of Days to Update: 8

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 03/13/2015
Next Scheduled EDR Contact: 06/22/2015
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 01/23/2015
Date Data Arrived at EDR: 02/13/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 24

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 03/30/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 03/10/2015
Next Scheduled EDR Contact: 06/22/2015
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/27/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Varies

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 12/30/2014
Date Data Arrived at EDR: 12/31/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 29

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 03/06/2015
Next Scheduled EDR Contact: 06/15/2015
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/31/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 44

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 01/29/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 01/15/2015
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 14

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/27/2015
Next Scheduled EDR Contact: 07/06/2015
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 01/23/2015
Date Data Arrived at EDR: 02/06/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 04/09/2015
Next Scheduled EDR Contact: 07/27/2015
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 10/15/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 33

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/16/2015
Next Scheduled EDR Contact: 04/27/2015
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 12/29/2014
Date Data Arrived at EDR: 01/08/2015
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 21

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 03/09/2015
Next Scheduled EDR Contact: 06/22/2015
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 02/27/2015
Date Data Arrived at EDR: 02/27/2015
Date Made Active in Reports: 03/25/2015
Number of Days to Update: 26

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 04/09/2015
Next Scheduled EDR Contact: 07/20/2015
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 01/18/2015
Date Data Arrived at EDR: 02/27/2015
Date Made Active in Reports: 03/25/2015
Number of Days to Update: 26

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 03/09/2015
Next Scheduled EDR Contact: 06/22/2015
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 02/01/2015
Date Data Arrived at EDR: 02/13/2015
Date Made Active in Reports: 03/25/2015
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 04/19/2013
Number of Days to Update: 52

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/24/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Biennially

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UIC: UIC Listing

A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 11/19/2014
Date Data Arrived at EDR: 12/15/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 45

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 03/20/2015
Next Scheduled EDR Contact: 06/29/2015
Data Release Frequency: Varies

NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 03/12/2015
Date Data Arrived at EDR: 03/13/2015
Date Made Active in Reports: 03/24/2015
Number of Days to Update: 11
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 03/13/2015
Next Scheduled EDR Contact: 06/01/2015
Data Release Frequency: Quarterly

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 03/10/2015
Date Data Arrived at EDR: 03/31/2015
Date Made Active in Reports: 04/10/2015
Number of Days to Update: 10
Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 03/31/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List
The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 10/21/1993
Date Data Arrived at EDR: 11/01/1993
Date Made Active in Reports: 11/19/1993
Number of Days to Update: 18
Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 03/23/2015
Next Scheduled EDR Contact: 07/06/2015
Data Release Frequency: No Update Planned

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 02/18/2015
Date Data Arrived at EDR: 02/20/2015
Date Made Active in Reports: 03/12/2015
Number of Days to Update: 20
Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 03/09/2015
Next Scheduled EDR Contact: 06/22/2015
Data Release Frequency: Annually

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13
Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 03/30/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 01/26/2015
Date Data Arrived at EDR: 01/28/2015
Date Made Active in Reports: 02/26/2015
Number of Days to Update: 29

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 10/15/2014
Date Made Active in Reports: 11/19/2014
Number of Days to Update: 35

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 01/16/2015
Next Scheduled EDR Contact: 04/27/2015
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 03/25/2014
Date Made Active in Reports: 04/28/2014
Number of Days to Update: 34

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 03/27/2015
Next Scheduled EDR Contact: 07/06/2015
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/14/2015
Next Scheduled EDR Contact: 07/27/2015
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/18/2015
Next Scheduled EDR Contact: 06/01/2015
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 02/17/2015
Date Data Arrived at EDR: 02/20/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 11

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 02/16/2015
Next Scheduled EDR Contact: 06/01/2015
Data Release Frequency: Varies

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/16/2014
Date Data Arrived at EDR: 10/31/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 17

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 03/30/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/16/2014
Date Data Arrived at EDR: 10/31/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 17

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 03/30/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Annually

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 03/09/2015
Date Data Arrived at EDR: 03/10/2015
Date Made Active in Reports: 03/25/2015
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 02/16/2015
Next Scheduled EDR Contact: 06/01/2015
Data Release Frequency: Quarterly

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 03/13/2015
Next Scheduled EDR Contact: 06/22/2015
Data Release Frequency: Varies

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/13/2015
Next Scheduled EDR Contact: 05/25/2015
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/14/2015
Next Scheduled EDR Contact: 07/27/2015
Data Release Frequency: N/A

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 02/13/2015
Next Scheduled EDR Contact: 05/25/2015
Data Release Frequency: Quarterly

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 11/25/2014
Date Data Arrived at EDR: 11/26/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 64

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 04/10/2015
Next Scheduled EDR Contact: 07/20/2015
Data Release Frequency: Varies

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/09/2015
Next Scheduled EDR Contact: 05/25/2015
Data Release Frequency: Quarterly

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 03/16/2015
Date Data Arrived at EDR: 03/18/2015
Date Made Active in Reports: 03/24/2015
Number of Days to Update: 6

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 03/18/2015
Next Scheduled EDR Contact: 06/29/2015
Data Release Frequency: Quarterly

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 02/02/2015
Date Data Arrived at EDR: 02/06/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 25

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Quarterly

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 01/30/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

HWP: EnviroStor Permitted Facilities Listing
Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 02/23/2015
Date Data Arrived at EDR: 02/24/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 7

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/24/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database
A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 01/12/2015
Date Data Arrived at EDR: 01/13/2015
Date Made Active in Reports: 02/03/2015
Number of Days to Update: 21

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 04/15/2015
Next Scheduled EDR Contact: 07/27/2015
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 04/15/2015
Next Scheduled EDR Contact: 07/27/2015
Data Release Frequency: Varies

MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 01/16/2015
Date Data Arrived at EDR: 03/10/2015
Date Made Active in Reports: 03/18/2015
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 03/10/2015
Next Scheduled EDR Contact: 06/22/2015
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/21/2015
Date Data Arrived at EDR: 01/28/2015
Date Made Active in Reports: 02/26/2015
Number of Days to Update: 29

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 03/30/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 01/21/2015
Date Data Arrived at EDR: 01/28/2015
Date Made Active in Reports: 02/26/2015
Number of Days to Update: 29

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 03/30/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List

Cupa Facility List

Date of Government Version: 03/09/2015
Date Data Arrived at EDR: 03/24/2015
Date Made Active in Reports: 03/31/2015
Number of Days to Update: 7

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 03/23/2015
Next Scheduled EDR Contact: 06/22/2015
Data Release Frequency: Varies

BUTTE COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility Listing
Cupa facility list.

Date of Government Version: 11/20/2014
Date Data Arrived at EDR: 11/24/2014
Date Made Active in Reports: 01/07/2015
Number of Days to Update: 44

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 04/14/2015
Next Scheduled EDR Contact: 04/27/2015
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 03/03/2015
Date Data Arrived at EDR: 03/05/2015
Date Made Active in Reports: 03/10/2015
Number of Days to Update: 5

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 03/30/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 06/11/2014
Date Data Arrived at EDR: 06/13/2014
Date Made Active in Reports: 07/07/2014
Number of Days to Update: 24

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 02/09/2015
Next Scheduled EDR Contact: 05/25/2015
Data Release Frequency: Varies

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 02/23/2015
Date Data Arrived at EDR: 02/25/2015
Date Made Active in Reports: 03/04/2015
Number of Days to Update: 7

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 02/02/2015
Next Scheduled EDR Contact: 05/18/2015
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 02/23/2015
Date Data Arrived at EDR: 02/25/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 6

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 02/16/2015
Next Scheduled EDR Contact: 05/18/2015
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 02/24/2015
Date Data Arrived at EDR: 02/25/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 6

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 02/02/2015
Next Scheduled EDR Contact: 05/18/2015
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 01/16/2015
Date Made Active in Reports: 02/05/2015
Number of Days to Update: 20

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 04/06/2015
Next Scheduled EDR Contact: 07/20/2015
Data Release Frequency: Semi-Annually

HUMBOLDT COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 03/11/2015
Date Data Arrived at EDR: 03/13/2015
Date Made Active in Reports: 03/24/2015
Number of Days to Update: 11

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Varies

IMPERIAL COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 02/10/2015
Date Data Arrived at EDR: 02/12/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 19

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 02/09/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 33

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 07/22/2014
Date Data Arrived at EDR: 11/12/2014
Date Made Active in Reports: 12/19/2014
Number of Days to Update: 37

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 05/25/2015
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 11/21/2014
Date Data Arrived at EDR: 11/25/2014
Date Made Active in Reports: 12/30/2014
Number of Days to Update: 35

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 04/10/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/20/2015
Date Data Arrived at EDR: 01/21/2015
Date Made Active in Reports: 02/05/2015
Number of Days to Update: 15

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 01/19/2015
Next Scheduled EDR Contact: 05/04/2015
Data Release Frequency: Varies

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 03/23/2015
Next Scheduled EDR Contact: 07/06/2015
Data Release Frequency: No Update Planned

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 11/24/2014
Date Data Arrived at EDR: 01/30/2015
Date Made Active in Reports: 03/04/2015
Number of Days to Update: 33

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 04/13/2015
Next Scheduled EDR Contact: 07/27/2015
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 01/19/2015
Date Data Arrived at EDR: 01/20/2015
Date Made Active in Reports: 02/05/2015
Number of Days to Update: 16

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 01/20/2015
Next Scheduled EDR Contact: 05/04/2015
Data Release Frequency: Varies

City of Los Angeles Landfills

Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 03/05/2009
Date Data Arrived at EDR: 03/10/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 29

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 04/15/2015
Next Scheduled EDR Contact: 08/03/2015
Data Release Frequency: Varies

Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/15/2015
Date Data Arrived at EDR: 01/29/2015
Date Made Active in Reports: 03/10/2015
Number of Days to Update: 40

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 01/19/2015
Next Scheduled EDR Contact: 05/04/2015
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank

Underground storage tank sites located in El Segundo city.

Date of Government Version: 03/30/2015
Date Data Arrived at EDR: 04/02/2015
Date Made Active in Reports: 04/13/2015
Number of Days to Update: 11

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 03/06/2015
Next Scheduled EDR Contact: 08/03/2015
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 01/29/2015
Date Data Arrived at EDR: 02/13/2015
Date Made Active in Reports: 02/26/2015
Number of Days to Update: 13

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Annually

City of Torrance Underground Storage Tank

Underground storage tank sites located in the city of Torrance.

Date of Government Version: 01/08/2015
Date Data Arrived at EDR: 01/15/2015
Date Made Active in Reports: 01/27/2015
Number of Days to Update: 12

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 04/13/2015
Next Scheduled EDR Contact: 07/27/2015
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 03/20/2015
Date Data Arrived at EDR: 03/24/2015
Date Made Active in Reports: 03/31/2015
Number of Days to Update: 7

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 03/23/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 10/08/2014
Date Data Arrived at EDR: 10/22/2014
Date Made Active in Reports: 12/15/2014
Number of Days to Update: 54

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 04/15/2015
Next Scheduled EDR Contact: 07/20/2015
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 02/23/2015
Date Data Arrived at EDR: 02/24/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 7

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List
CUPA Facility List

Date of Government Version: 02/27/2015
Date Data Arrived at EDR: 03/06/2015
Date Made Active in Reports: 03/10/2015
Number of Days to Update: 4

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 02/26/2015
Next Scheduled EDR Contact: 06/15/2015
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 03/19/2015
Date Data Arrived at EDR: 03/20/2015
Date Made Active in Reports: 03/31/2015
Number of Days to Update: 11

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 12/05/2011
Date Data Arrived at EDR: 12/06/2011
Date Made Active in Reports: 02/07/2012
Number of Days to Update: 63

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/26/2015
Next Scheduled EDR Contact: 06/15/2015
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 23

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/26/2015
Next Scheduled EDR Contact: 06/15/2015
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 02/12/2015
Date Data Arrived at EDR: 02/13/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 18

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 02/06/2015
Next Scheduled EDR Contact: 05/18/2015
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 02/01/2015
Date Data Arrived at EDR: 02/13/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 18

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/09/2015
Next Scheduled EDR Contact: 05/25/2015
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 02/03/2015
Date Data Arrived at EDR: 02/13/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 18

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/09/2015
Next Scheduled EDR Contact: 05/25/2015
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 02/01/2015
Date Data Arrived at EDR: 02/13/2015
Date Made Active in Reports: 02/26/2015
Number of Days to Update: 13

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/09/2015
Next Scheduled EDR Contact: 05/25/2015
Data Release Frequency: Quarterly

PLACER COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 03/10/2015
Date Data Arrived at EDR: 03/12/2015
Date Made Active in Reports: 03/18/2015
Number of Days to Update: 6

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 03/09/2015
Next Scheduled EDR Contact: 06/22/2015
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 01/28/2015
Date Data Arrived at EDR: 01/29/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 33

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 03/23/2015
Next Scheduled EDR Contact: 07/06/2015
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 01/28/2015
Date Data Arrived at EDR: 01/29/2015
Date Made Active in Reports: 02/26/2015
Number of Days to Update: 28

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 03/23/2015
Next Scheduled EDR Contact: 07/06/2015
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 11/03/2014
Date Data Arrived at EDR: 01/07/2015
Date Made Active in Reports: 02/03/2015
Number of Days to Update: 27

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 04/08/2015
Next Scheduled EDR Contact: 07/20/2015
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 11/03/2014
Date Data Arrived at EDR: 01/09/2015
Date Made Active in Reports: 02/03/2015
Number of Days to Update: 25

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 04/08/2015
Next Scheduled EDR Contact: 07/20/2015
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 03/02/2015
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/10/2015
Number of Days to Update: 7

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 02/09/2015
Next Scheduled EDR Contact: 05/25/2015
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 09/23/2013
Date Data Arrived at EDR: 09/24/2013
Date Made Active in Reports: 10/17/2013
Number of Days to Update: 23

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 03/10/2015
Next Scheduled EDR Contact: 06/22/2015
Data Release Frequency: Quarterly

Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2014
Date Data Arrived at EDR: 11/21/2014
Date Made Active in Reports: 12/29/2014
Number of Days to Update: 38

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 03/09/2015
Next Scheduled EDR Contact: 06/22/2015
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities

A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 02/09/2015
Next Scheduled EDR Contact: 05/25/2015
Data Release Frequency: Quarterly

Underground Storage Tank Information

Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/29/2010
Date Data Arrived at EDR: 03/10/2011
Date Made Active in Reports: 03/15/2011
Number of Days to Update: 5

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 02/09/2015
Next Scheduled EDR Contact: 05/25/2015
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 03/24/2015
Date Data Arrived at EDR: 03/25/2015
Date Made Active in Reports: 03/31/2015
Number of Days to Update: 6
Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 03/23/2015
Next Scheduled EDR Contact: 07/06/2015
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 02/23/2015
Date Data Arrived at EDR: 02/24/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 7
Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 01/09/2015
Date Data Arrived at EDR: 01/12/2015
Date Made Active in Reports: 02/03/2015
Number of Days to Update: 22
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 03/16/2015
Next Scheduled EDR Contact: 06/29/2015
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/16/2015
Date Data Arrived at EDR: 03/17/2015
Date Made Active in Reports: 03/24/2015
Number of Days to Update: 7
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 03/13/2015
Next Scheduled EDR Contact: 06/29/2015
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28
Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List
Cupa facility list

Date of Government Version: 02/23/2015
Date Data Arrived at EDR: 02/25/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 6

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 02/26/2015
Next Scheduled EDR Contact: 06/15/2015
Data Release Frequency: Annually

Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 02/23/2015
Date Data Arrived at EDR: 02/24/2015
Date Made Active in Reports: 03/04/2015
Number of Days to Update: 8

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 05/25/2015
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List
CUPA facility listing.

Date of Government Version: 11/24/2014
Date Data Arrived at EDR: 11/25/2014
Date Made Active in Reports: 12/31/2014
Number of Days to Update: 36

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 03/11/2015
Date Data Arrived at EDR: 03/13/2015
Date Made Active in Reports: 03/24/2015
Number of Days to Update: 11

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 03/13/2015
Date Data Arrived at EDR: 03/19/2015
Date Made Active in Reports: 03/24/2015
Number of Days to Update: 5

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 03/13/2015
Next Scheduled EDR Contact: 06/29/2015
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 03/13/2015
Date Data Arrived at EDR: 03/20/2015
Date Made Active in Reports: 03/31/2015
Number of Days to Update: 11

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 03/13/2015
Next Scheduled EDR Contact: 06/29/2015
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List
Cupa Facility list

Date of Government Version: 03/31/2015
Date Data Arrived at EDR: 04/02/2015
Date Made Active in Reports: 04/10/2015
Number of Days to Update: 8

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 03/30/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 04/01/2015
Date Data Arrived at EDR: 04/02/2015
Date Made Active in Reports: 04/13/2015
Number of Days to Update: 11

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 03/30/2015
Next Scheduled EDR Contact: 07/13/2015
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 03/09/2015
Date Data Arrived at EDR: 03/10/2015
Date Made Active in Reports: 03/18/2015
Number of Days to Update: 8

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 03/09/2015
Next Scheduled EDR Contact: 06/22/2015
Data Release Frequency: Semi-Annually

TUOLUMNE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/30/2015
Date Data Arrived at EDR: 02/03/2015
Date Made Active in Reports: 02/27/2015
Number of Days to Update: 24

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks

The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 01/27/2015
Date Data Arrived at EDR: 02/19/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 12

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 02/16/2015
Next Scheduled EDR Contact: 06/01/2015
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites

Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 04/02/2015
Next Scheduled EDR Contact: 07/20/2015
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites

Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 02/16/2015
Next Scheduled EDR Contact: 06/01/2015
Data Release Frequency: Quarterly

Medical Waste Program List

To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 12/29/2014
Date Data Arrived at EDR: 01/30/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 32

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 01/26/2015
Next Scheduled EDR Contact: 05/11/2015
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 02/27/2015
Date Data Arrived at EDR: 03/18/2015
Date Made Active in Reports: 03/26/2015
Number of Days to Update: 8

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/18/2015
Next Scheduled EDR Contact: 06/29/2015
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 03/26/2015
Date Data Arrived at EDR: 04/01/2015
Date Made Active in Reports: 04/13/2015
Number of Days to Update: 12

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 03/23/2015
Next Scheduled EDR Contact: 07/06/2015
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 02/17/2015
Date Data Arrived at EDR: 02/19/2015
Date Made Active in Reports: 03/03/2015
Number of Days to Update: 12

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 02/16/2015
Next Scheduled EDR Contact: 05/18/2015
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/17/2014
Next Scheduled EDR Contact: 03/02/2015
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 08/28/2012
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/14/2015
Next Scheduled EDR Contact: 07/27/2015
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2015
Date Data Arrived at EDR: 02/04/2015
Date Made Active in Reports: 02/27/2015
Number of Days to Update: 23

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 02/04/2015
Next Scheduled EDR Contact: 05/18/2015
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 07/21/2014
Date Made Active in Reports: 08/25/2014
Number of Days to Update: 35

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/19/2015
Next Scheduled EDR Contact: 05/04/2015
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 07/15/2014
Date Made Active in Reports: 08/13/2014
Number of Days to Update: 29

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/23/2015
Next Scheduled EDR Contact: 06/08/2015
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 03/19/2015
Date Made Active in Reports: 04/07/2015
Number of Days to Update: 19

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/13/2015
Next Scheduled EDR Contact: 06/29/2015
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

STREET AND ADDRESS INFORMATION

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INITIAL SITE ASSESSMENT
I STREET BRIDGE REPLACEMENT PROJECT
Sacramento, California and
West Sacramento, California

APPENDIX F

Site Photographs

Photo 1: Old pier west of Jibboom

Photo 3: Jibboom Street and I-5 looking southeast

Photo 2: I-5 embankment at proposed bridge approach

Photo 4: Railyard tower

Photo 5: I Street Bridge

Photo 7: Old warehouse buildings along west side of Jibboom stretch

Photo 6: View from Jibboom Street looking south toward I

Photo 8: Old warehouse building along west side of Jibboom

Photo 9: Monitoring Wells along former manufactured gas plant

Photo 11: Former manufactured gas plant site

Photo 10: Bike trail adjacent to Jibboom Street

Photo 12: View of Railroad Boulevard from Jibboom Street

Photo 13: View of Railroad Boulevard from Jibboom Street

Photo 15: Jibboom Street bike path looking north

Photo 14: View of Northern Shops study area

Photo 16: Overview of Railyards Northern Shop area

Photo 17: West Sacramento River walk water tower

Photo 19: Levee access road West Sacramento

Photo 18: Levee access road, West Sacramento

Photo 20: Drum at West Sacramento River walk water tower parcel

Photo 21: West Sacramento River walk water tower

Photo23: Firehouse Block 317 3rd Street

Photo 22:300 3rd Street vacant lot/former Dorris Shell

Photo 24: Capitol Plating 319 3rd Street

Photo 25: Capitol Plating 319 3rd Street

Photo 27: Firehouse Block 317 3rd Street

Photo 26: Firehouse Block 317 3rd Street

Photo 28: Firehouse and Capitol Plating east side

Photo 29: Old police building site 305 3rd Street

Photo 31:305 3rd Street looking north

Photo 30: Existing building at 325 3rd Street

Photo 32: 300 3rd Street Former Dorris Shell

Photo 33: C Street and 3rd Street

Photo 35: 300 3rd Street

Photo 34: C Street and 4th Street

Photo 36: 427 C Street Former Gary's Mohawk Station

Photo 37: 424 C Street former Martinez Gulf Station

Photo 39: 427 C Street(former Gary's Mohawk Station)

Photo 38: 500 C Street former Hudson Oil

Photo 40: C Street at new bridge approach location

INITIAL SITE ASSESSMENT
I STREET BRIDGE REPLACEMENT PROJECT
Sacramento, California and
West Sacramento, California

ATTACHEMENT 1

Entek Hazardous Material Inspection Report

ENTEK
CONSULTING GROUP, INC.
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HAZARDOUS MATERIALS SURVEY
FINAL REPORT

CLIENT

Blackburn Consulting
2491 Boatman Avenue
West Sacramento, CA 95961

CONTACT

Laura Long
Environmental Engineer

SURVEY ADDRESS

I Street Bridge & Roadway Approaches
Sacramento & West Sacramento, California

STRUCTURE SURVEYED

I Street Bridge & Roadway Approaches
I Street Bridge Replacement Project

PREPARED BY

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Entek Project #15-3531

May 14, 2015

ENTEK

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Appendices

A. Asbestos Related Documents
B. Lead Related Documents
C. Backup Documentation
Includes West Sacramento Historical Society Document

Executive Summary

The United States Environmental Protection Agency, National Emission Standards for Hazardous Air Pollutants (US EPA NESHAP), 40 CFR Part 61 - Nov. 20, 1990, requires an owner or operator of a demolition or renovation project to thoroughly inspect the affected facility or part of the facility where the demolition or renovation operation will occur for the presence of asbestos-containing materials (ACM) prior to the commencement of that project.

This inspection report was requested by Ms. Laura Long with Blackburn Engineering.

The purpose of the inspection was to comply with US EPA NESHAP requirements and the Sacramento Metropolitan Air Quality Management District (SMAQMD) which has jurisdiction for this project site to determine if asbestos containing materials are present which may be impacted during an upcoming bridge replacement project. It is our understanding the bridge was constructed beginning in 1910.

The attached drawing(s) show approximate sample locations and also identify those bulk sample materials analyzed and found to contain asbestos greater than 1% with a (+) after the sample number. Materials analyzed and found to contain less than 1% asbestos or reported as none detected have a (-) after each sample number. Individuals who view the sample locations and associated results indicated with either a (-) or a (+) on the drawing to make determinations take the risk of misidentifying a material and may arrive at determinations which are in direct conflict with the written findings of this report. This use of the drawing and the information provided on it relating to individual sample results in determining if a material does or does not contain asbestos is not recommended.

Materials are classified in the tables of this report as regulated asbestos containing material (RACM), Category I (CAT-I) or Category II (CAT-II) ACM, or asbestos containing construction material (ACCM), which included collecting multiple samples of some materials.

This is a summary of the report. The report must be read in its entirety, and the reader must review all the detailed information provided in the body of the report prior to making any interpretations, or conclusions pertaining to the information. Any conclusions made by the reader about the information provided in the body of this report which are contradictory or not included in this report are the responsibility of the reader.

Asbestos

On May 5, 2015, Entek conducted a survey specific to the I Street Bridge and Roadway Approaches. The bridge control house was inaccessible at the time of the survey and was not included in this inspection.

The results of testing for asbestos during this survey indicate asbestos is present in the railing gaskets and the fastener sealants. Specifics pertaining to individual materials can be found in later sections of this report.

Lead

Entek investigated existing paints and applied coatings in an effort to determine if lead was present in these materials. The following paints contain more than 5,000 ppm (0.5%) or 1.0 mg/cm^2 lead and are classified as lead-based paint (LBP):

Silver Paint on Metal - Bridge Structure	36% Lead by weight
Black Paint on Metal - Bridge Structure	11% Lead by weight
White Paint on Metal - North East Approach	2.0% Lead by weight

If more than 100 square feet of these paints are impacted by a “trigger task”, prior notification to Cal/OSHA will be required.

Additionally, the gasket located at the base of the light boxes existing on the northeast approaches was determined by the laboratory to be pure lead. Use precaution when handling this material.

Introduction

This report presents results of an asbestos and lead survey performed by Entek which included all accessible areas of the I Street Bridge structure, located on I Street and spanning the Sacramento River. Also included were the roadway approaches leading to the bridge. The bridge control house was inaccessible and therefore not included in this survey.

I conducted this survey on May 5, 2015. I am a US EPA Asbestos Hazard Emergency Response Act (AHERA)-accredited building inspector, a Cal/OSHA Certified Asbestos Consultant (CAC) and a State of California Department of Public Health (CDPH) certified Lead Inspector/Assessor.

This report was prepared for Ms. Laura Long with Blackburn Engineering.

Structure Description

The I Street Bridge is a two-lane, historic steel truss swing bridge, constructed beginning in 1910. This bridge carries rail and automobile traffic over the Sacramento river between Sacramento and West Sacramento, California. As reported by the West Sacramento Historical Society (attached), the current bridge approach in West Sacramento was constructed in 1959. It is likely that the similar looking approach on the Sacramento side was built at the same time.

Asbestos Inspection and Sample Collection Protocols

Entek included all accessible areas of the I Street Bridge structure, located on I Street and spanning the Sacramento River. Also included were the roadway approaches leading to the bridge. The bridge control house was inaccessible and therefore not included in this survey.

Entek did not use any demolition methods to look within enclosed cavities during this investigation. Entek did include all suspect materials observed in, on, or associated with the

areas included in this report.

Bulk samples were collected of various materials suspected to contain asbestos by utilizing a power drill and coring tube, cutting the materials with a razor knife, or use of other appropriate hand tools.

Miscellaneous materials were collected from each homogenous area in a manner sufficient to determine whether the material is or is not ACM as required in 40 CFR Part 763, Asbestos-Containing Materials in Schools; Final Rule and Notice, published October 30, 1987.

Approximate locations of all samples collected during this inspection are indicated on the "Bulk Asbestos Material Analysis Request Form for Entek", which served as the chain of custody for the samples, and on the diagram attached to this report.

Asbestos Bulk Sample Results

There were several materials observed which are considered "suspect" under US EPA guidelines. Under current US EPA guidelines for conducting inspections for ACM, all "suspect" materials must be assumed to contain asbestos until otherwise determined by laboratory testing.

The samples of materials suspected of containing asbestos were submitted to Asbestech, a laboratory located in Carmichael, California. These samples were subsequently analyzed by polarized light microscopy (PLM) with dispersion staining. Asbestech is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for this analysis. Copies of Asbestech's laboratory reports and accreditations are attached.

US EPA NESHAP uses the terms RACM, CAT-I, & CAT-II when identifying materials which contain asbestos in amounts greater than 1%. Cal/OSHA uses the term ACCM which indicates a manufactured construction material contains greater than 0.1% asbestos by weight by the PLM method. This definition can be found in Title 8, 1529.

All samples found to contain <1% asbestos by PLM analysis which are not identified as containing >1% asbestos, classified as RACM, CAT-I, or CAT-II materials in the following results tables were additionally analyzed using the 400 point count (PC) method with analysis by PLM. This additional analysis is required by NESHAP and enforced by SMAQMD. The PC method analysis results were used only to verify a material did not contain >1% asbestos as a single layer material. A result reported as none detected or "trace" by the PC method only verified the initial PLM result of <1% and shall not be used to determine the identified material does not contain asbestos.

Neither OSHA or Cal/OSHA allow for composite sampling of wall system materials, and neither address the use of the PC method to confirm a material identified as containing <1% asbestos by the PLM method either contains <1% asbestos or is non-detected for asbestos. As a result, reporting of the asbestos content related to a composited material such as sheetrock/drywall and joint compound does not apply to determining if a material is or is not an ACM by OSHA or an ACCM by Cal/OSHA.

A total of 14 bulk samples were collected of all the materials considered to be "suspect", and which were observed during this investigation. Some of those samples contained multiple layers which were individually analyzed to determine their asbestos content. Analysis of all samples collected was by PLM with dispersion staining. Results of the analysis are listed in the following tables:

Suspect Materials Found or Known TO Contain >1% Asbestos (CAT-I)				
Sample ID#'s	**Suspect Material**	**Asbestos Content/Type (%) by PLM**	**Location**	**Total Estimated Quantity**
15-3531-02A	Gasket Beneath Rail	80-90% Chrysotile	West Roadway Approach	Approx 180 Square Feet
15-3531-08A	Gasket Beneath Rail	70-80% Chrysotile	Southeast Roadway Approach	Approx 200 Square Feet

NOTE: Any CAT-I or CAT-II materials identified in the previous tables which will be subjected to mechanical removal, must be considered RACM for the purposes of notification to SMAQMD/YSAQMD and classification of waste. Removal of any CAT-I or CAT-II materials prior to demolition of a structure is dependent upon how the materials will be impacted and if the impact will cause the materials to become friable. If any remaining CAT-I or CAT-II materials will become friable they must be removed prior to the initiation of demolition.

Suspect Materials Found or Known TO Contain <1% Asbestos (ACCM)				
Sample ID#'s	**Suspect Material**	**Asbestos Content/Type (%) by PLM/PC**	**Location**	**Total Estimated Quantity (Sq./Ln./Cu. Ft.)**
15-3531-03A	Fastener and Rail Sealant	<1% Chrysotile	West Roadway Approach	Approx 40 Square Feet

NOTE: Cal/OSHA regulates all materials containing greater than 0.1% asbestos. As a result, impact to materials identified as ACCM and ACM must be performed by properly asbestos trained personnel utilizing appropriate personal protection, work practices, as well as, properly constructed and demarcated work areas or containments, in accordance with Cal/OSHA asbestos regulations.

Suspect Materials Found NOT TO Contain Asbestos or Considered Non-Suspect				
Sample ID#'s	**Suspect Material**	**EPA AHERA "Suspected" ACBM**	**Asbestos Content**	**Location**
15-3531-01A, B	Concrete, West Approach	Miscellaneous	None Detected	West Approach
15-3531-04A	Silver Paint	Miscellaneous	None Detected	Bridge

Suspect Materials Found NOT TO Contain Asbestos or Considered Non-Suspect				
Sample ID#'s	**Suspect Material**	**EPA AHERA "Suspected" ACBM**	**Asbestos Content**	**Location**
15-3531-05A, B	Concrete, Bridge	Miscellaneous	None Detected	Bridge
15-3531-06A	Walkway Pavement	Miscellaneous	None Detected	Bridge
15-3531-07A, B	Concrete, Southeast Approach	Miscellaneous	None Detected	Southeast Approach
15-3531-09A, B	Concrete, Northeast Approach	Miscellaneous	None Detected	Northeast Approach
15-3531-10A	Gasket at Light Boxes**	Miscellaneous	None Detected	Northeast Approach

** This material was identified by the laboratory as being pure lead. Use precautions when handling.

US EPA AHERA uses three terms when determining the classification of a material for the purpose of sampling. These terms include miscellaneous, surfacing, and thermal system insulation (TSI).

Miscellaneous materials are building materials on structural components, structural members or fixtures, such as floor and ceiling tiles, and does not include surfacing material or TSI.

Surfacing materials are materials that are sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceiling and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

TSI is material applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain, water condensation, or for other purposes.

The information provided in the tables of this report are for use by the Owner in determining where asbestos containing materials are located, and whether or not any future work may impact those materials. The information is also provided for use by any contractor who may perform work in areas impacting the materials listed in this report, and for use as appropriate by asbestos abatement contractors to provide costs related to work impacting ACM.

Any building materials which are considered "suspect" for containing asbestos which have not been identified in this report must be assumed to contain asbestos in amounts >1% until properly investigated and/or tested.

Materials commonly excluded from being suspected for containing asbestos include, but are not limited to: unwrapped pink and yellow fiberglass insulating materials or products, foam

insulation, bare concrete, wood, metal, plastic, or glass. All other types of building materials or coatings on the materials listed above are commonly listed as "suspect" and must be tested prior to impact by a Contractor. Work impacting these untested or newly discovered materials must cease until an investigation can be completed.

Asbestos Regulatory Requirements

US EPA

The property included in this survey report is located in Sacramento and Yolo Counties. Sacramento Metropolitan Air Quality Management District (SMAQMD) has been given authority for enforcement of the NESHAP regulations by means of their own rules (Rule 902 Asbestos). The Yolo Solano Air Quality Management District (YSAQMD) enforces the NESHAP regulations by means of Rule 4.3.

A demolition is the wrecking, taking out, or burning of any load supporting structural member. A renovation is everything else. 10 day written notification to the SMAQMD & YSAQMD is required prior to the performance of any demolition project regardless of asbestos being present or not. This notification would also apply to any renovation project which involves the wrecking, taking out, or burning of any load bearing structural member during a renovation as well.

There is a sufficient amount of ACM present to require a 10 day notification to the SMAQMD & YSAQMD be submitted prior to starting work which will impact materials identified as RACM or CAT-I and CAT-II materials if they are made friable. If more than 160 square feet, 260 linear feet or 35 cubic feet of RACM is planned for removal on the project, formal written notification to SMAQMD & YSAQMD is required.

Cal/OSHA

Disturbance of any ACM or ACCM could generate airborne asbestos fibers and would be regulated by Cal/OSHA. Cal/OSHA worker health and safety regulations apply during any disturbance of ACM or ACCM by a person while in the employ of another. This is true regardless of friability or quantity disturbed. Since it has been estimated more than 100 square feet of ACM does exist and will be impacted during the upcoming project, a licensed asbestos contractor, certified by the State of California, and registered with Cal/OSHA is required to perform the asbestos related removal work. Entek recommends a licensed asbestos contractor be used to remove ACCM even if less than 100 square feet of ACCM is being disturbed.

For compliance with Title 8, Section 341.9, the asbestos contractor must send written notice at least one day (24 hours) prior to start of any work which will impact any amount of asbestos to the local office for the State of California, Department of Occupational Safety and Health, and perform all work in accordance with Cal/OSHA requirements.

Lead Inspection and Sampling

Entek investigated existing paints and applied coatings in an effort to determine if lead was present in these materials.

Lead Sampling Results

A total of 7 bulk samples of the painted surfaces associated with the bridge and approaches were collected and submitted to Asbestech laboratory. These samples were subsequently analyzed by atomic absorption spectrometry (AAS). Results of the analysis are listed in the following tables:

Paints/Coatings/ Materials Determined to be Lead Based Paint (LBP)		
Paint/Coating Color or Material	**Lead Content (ppm / %)**	**Component/Location**
Silver Paint on Metal	360,000 / 36%	Bridge Railings
Black Paint on Metal	110,000 / 11%	Bridge Structure & Supports
White Paint on Metal	20,000 / 2%	Northeast Approach Railings

LBP - Materials/coatings/paints meeting the definition of lead-based paint as defined by the CDPH and the US EPA, currently defined as containing lead in concentrations equal to or greater than 1.0 mg/cm^2, 5,000 ppm, or 0.5% by weight.

Paints/Coatings/Materials Determined NOT TO Contain Lead	
Paint/Coating Color or Material	**Structure Component**
Silver Paint on Metal	Western and Southeast Approach Guardrails (Typical Round Rails on Concrete Berms)
Yellow Roadway Striping	Roadway
White Roadway Striping	Roadway

Paints determined “NOT TO” contain lead for the purposes of this report are those samples which when analyzed did not indicate lead to be present at or above the limit of detection for the analysis method used. This limit of detection was 50 parts per million (ppm). As a result, any paints shown “NOT TO” contain lead will not require any special training or work practices related to lead when impacted.

Lead Regulatory Compliance

Any upcoming project which may result in the disturbance of lead containing products or surfaces, but is not intended to remediate a lead hazard or specifically designed to remove LBP to reduce or eliminate a known hazard, would be considered “lead related construction work”.

Lead related construction work does not fit the classification of a "lead abatement project" under CDPH Title 17 regulations. "*Abatement*" is defined in Title 17, Division 1, Chapter 8, Article 1 as "any set of measures designed to reduce or eliminate lead hazards or LBP for public and residential buildings, but does not include containment or cleaning." A *lead hazard* is defined in Title 17, Division 1, Chapter 8, Article 1 as "deteriorated LBP, lead contaminated dust, lead contaminated soil, disturbing LBP or presumed LBP without containment, or any other nuisance which may result in persistent and quantifiable lead exposure."

Lead related construction work means any "construction, alteration, painting, demolition, salvage, renovation, repair, or maintenance of any residential or public building, including preparation and cleanup, that, by using or disturbing lead-containing material or soil, may result in significant exposure of adults or children to lead". (Title 17, California Code of Regulations, Division 1, Chapter 8, Article 1).

Currently, Cal/OSHA has not established a definition for LBP, nor have they established minimum concentrations where their regulations do not apply. Cal/OSHA regulates all construction activities involving materials containing lead, including LBP. These regulations are found in CCR, Title 8 Section 1532.1 (§1532.1) Lead in Construction.

Since Cal/OSHA has not established a concentration of lead in a product where their regulations do not apply, any disturbance to products containing lead come under the jurisdiction of Cal/OSHA and their regulations. Disturbance of paints/coatings or materials determined to be LBP may trigger a pre-work notification to Cal/OSHA if "trigger tasks" disturb 100 square feet or more of those paints/coatings or materials. Trigger tasks are described in Title 8 CCR 1532.1.

Limitations

Entek included all accessible areas of the I Street Bridge structure, located on I Street and spanning the Sacramento River. Also included were the roadway approaches leading to the bridge. The bridge control house was inaccessible and therefore not included in this survey.

As a result the information provided in this inspection report may not be used to extend the inspection results to areas not included in this report without additional review and sampling as necessary.

Entek did not perform any destructive sampling to look into existing cavities. As a result, it may be possible for materials to be hidden in these areas which are not included in this report. Entek also did not employ any destructive measures, including exterior areas covered with asphalt, concrete, or dirt.

If any new materials not listed as having been sampled, or listed as assumed for containing asbestos in this report are discovered, the new material must be assumed to contain asbestos until properly inspected.

Entek's policy is to retain a full copy of these written documents for three (3) years once the file is closed and final billed. At the end of the three (3) year period the written files will be

destroyed without further notice. It is suggested copies of the file(s) are maintained as per Blackburn Consulting's policy.

In an effort to help our environment, Entek will be providing only this electronic copy of the report and its attachments for your use. However, a hard copy will be provided upon request.

Thank you for choosing Entek for your hazardous materials needs. Please contact me at (916) 632-6800 or by email to jsmith@entekgroup.com if you have any questions regarding this report.

Prepared by:

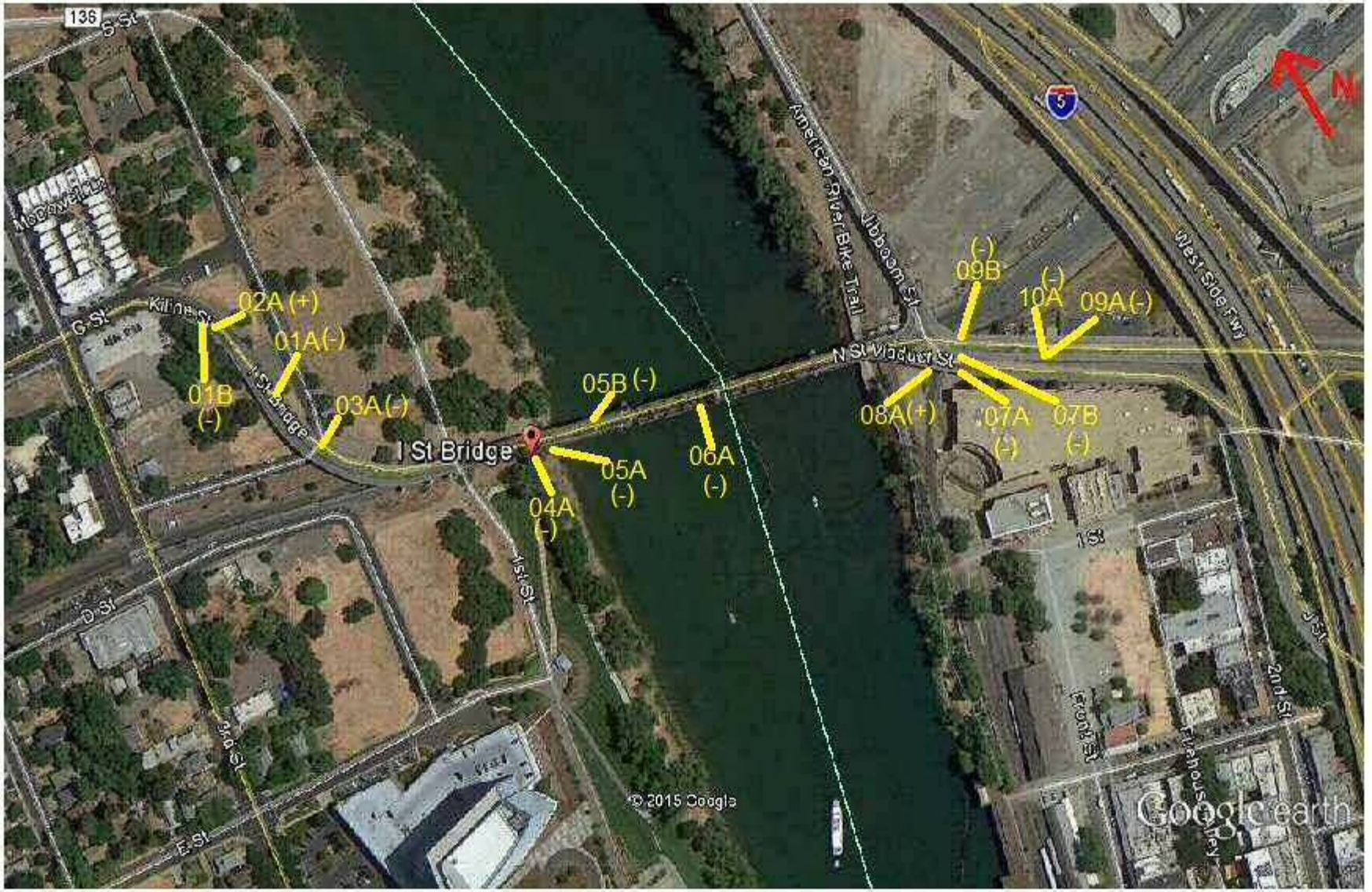
Jodi L. Smith, SM, CIH, CSP
Cal/OSHA CAC #08-4345
CDPH I/S/M Certification #19230

Appendices

A. Asbestos Related Documents
B. Lead Related Documents
C. Backup Documentation
Includes West Sacramento Historical Society Document

Z:\Clients\Blackburn Consulting\15-3531 I Street Bridge Replacment - Asb & Pb Survey\Project Letters & Reports\Final Haz Mat Insp Rprt 051415.wpd

Appendix A. Asbestos Related Documents



Sample Numbers are Preceded by 15-3531-

I Street Bridge West Sacramento, CA Entek Project Number 15-3531	Entek Consulting Group, Inc. 4200 Rocklin Road, Suite 7 Rocklin, California 95677 Map Not to Scale	Approximate Locations of Bulk Asbestos Samples Collected by Jodi Smith on May 5, 2015

ASBESTECH
6825 Fair Oaks Blvd., Suite 103
Carmichael, California 95608
Tel.(916) 481-8902 Fax (916) 481-3975

Client:
Entek Consulting Group, Inc.
4200 Rocklin Rd., Suite 7
Rocklin, CA 95677

Job:
15-3531 Blackburn Consulting
I Street Bridge & Approaches
Sacramento, Ca

BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 61838
Date/Time Collected: 5/5/15
Date Received: 5/7/15

NVLAP Lab Code 101442-0
CDPH # 1153
Date Analyzed: 5/12/15

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-15-3531-03A	Gray fastener & rail sealant, western approach east side	TRACE CHRYSOTILE	Calcite

NOTE: This sample was analyzed by quantitative Point Counting using a Chalkley Point Array over 400 non-empty points.

THE ANALYSIS USES POLARIZED LIGHT MICROSCOPY AND DISPERSION STAINING FOLLOWING E.P.A. METHOD 600/R-93/116. NON-FRIABLE MATERIALS WERE ANALYZED APPLYING THE SAME METHOD. THE LOWER DETECTION LIMIT IS <1 % WITH THE PROVISO THAT PLM MAY NOT DETECT FIBERS <0.25 MICRONS IN DIAMETER THAT MAY BE PRESENT IN SAMPLES SUCH AS FLOOR TILES. IN ACCORDANCE WITH TITLE 22, CCR, SECTION 66261.24(a)(2)(A),THE MCL IS 1 %. SAMPLES WERE NOT COLLECTED BY ASBESTECH. THIS REPORT MUST NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE APPROVAL OF ASBESTECH. THIS REPORT RELATES ONLY TO THE ITEMS TESTED. THIS REPORT MUST NOT BE USED TO CLAIM PRODUCT ENDORSEMENT BY N.V.L.A.P. OR ANY AGENCY OF THE U.S. GOVERNMENT. ASBESTECH ACCEPTS TECHNICAL RESPONSIBILITY FOR THIS REPORT AND DATE OF ISSUE.

NVLAP LAB CODE 101442-0 LAB DIRECTOR: TOM CONLON ANALYST: JIM JUNGLES

ASBESTECH
6825 Fair Oaks Blvd., Suite 103
Carmichael, California 95608
Tel.(916) 481-8902 Fax (916) 481-3975

Client:
Entek Consulting Group, Inc.
4200 Rocklin Rd., Suite 7
Rocklin, CA 95677

Job:
15-3531 Blackburn Consulting
I Street Bridge & Approaches
Sacramento, Ca

BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 61825-1
Date/Time Collected: 5/5/15
Date Received: 5/7/15

NVLAP Lab Code 101442-0
CDPH # 1153
Date Analyzed: 5/11/15

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-15-3531-01A	Gray concrete, western approach east side	NONE DETECTED	Granular Mins.
01B	Gray concrete, western approach west side	NONE DETECTED	Granular Mins.
02A	Black gasket between rail and concrete berm, western approach east side	80-90 CHRYSOTILE	Opaques
03A	Gray fastener & rail sealant, western approach east side	<1 CHRYSOTILE	Calcite
04A	Silver paint, bridge south side	NONE DETECTED	Opaques
05A	Gray concrete, bridge south side	NONE DETECTED	Granular Mins.
05B	Gray concrete, bridge north side	NONE DETECTED	Granular Mins.
06A	Gray walkway pavement, bridge north side	NONE DETECTED	Granular Mins.
07A	Gray concrete, SE approach south side	NONE DETECTED	Granular Mins.
07B	Gray concrete, SE approach north side	NONE DETECTED	Granular Mins.

THE ANALYSIS USES POLARIZED LIGHT MICROSCOPY AND DISPERSION STAINING FOLLOWING E.P.A. METHOD 600/R-93/116. NON-FRIABLE MATERIALS WERE ANALYZED APPLYING THE SAME METHOD. THE LOWER DETECTION LIMIT IS <1 % WITH THE PROVISO THAT PLM MAY NOT DETECT FIBERS <0.25 MICRONS IN DIAMETER THAT MAY BE PRESENT IN SAMPLES SUCH AS FLOOR TILES. IN ACCORDANCE WITH TITLE 22, CCR, SECTION 66261.24(a)(2)(A),THE MCL IS 1 %. SAMPLES WERE NOT COLLECTED BY ASBESTECH. THIS REPORT MUST NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE APPROVAL OF ASBESTECH. THIS REPORT RELATES ONLY TO THE ITEMS TESTED. THIS REPORT MUST NOT BE USED TO CLAIM PRODUCT ENDORSEMENT BY N.V.L.A.P. OR ANY AGENCY OF THE U.S. GOVERNMENT. ASBESTECH ACCEPTS TECHNICAL RESPONSIBILITY FOR THIS REPORT AND DATE OF ISSUE.

NVLAP LAB CODE 101442-0 LAB DIRECTOR: TOM CONLON ANALYST: JIM JUNGLES

ASBESTECH
6825 Fair Oaks Blvd., Suite 103
Carmichael, California 95608
Tel.(916) 481-8902 Fax (916) 481-3975

Client:
Entek Consulting Group, Inc.
4200 Rocklin Rd., Suite 7
Rocklin, CA 95677

Job:
15-3531 Blackburn Consulting
I Street Bridge & Approaches
Sacramento, Ca

BULK ASBESTOS ANALYSIS REPORT

LAB JOB # 61825-2
Date/Time Collected: 5/5/15
Date Received: 5/7/15

NVLAP Lab Code 101442-0
CDPH # 1153
Date Analyzed: 5/11/15

Sample No.	*Color/Description*	*% Type Asbestos*	*Other Materials*
ECG-15-3531-08A	Gray gasket between rail and concrete berm, SE approach south side	70-80 CHRYSOTILE	Opaques
09A	Gray concrete, NE approach south side	NONE DETECTED	Granular Mins.
09B	Gray concrete, NE approach north side	NONE DETECTED	Granular Mins.
10A	Silver gasket at light boxes, NE approach south side	NONE DETECTED	Opaques
	Gray coating	NONE DETECTED	Opaques

THE ANALYSIS USES POLARIZED LIGHT MICROSCOPY AND DISPERSION STAINING FOLLOWING E.P.A. METHOD 600/R-93/116. NON-FRIABLE MATERIALS WERE ANALYZED APPLYING THE SAME METHOD. THE LOWER DETECTION LIMIT IS <1 % WITH THE PROVISO THAT PLM MAY NOT DETECT FIBERS <0.25 MICRONS IN DIAMETER THAT MAY BE PRESENT IN SAMPLES SUCH AS FLOOR TILES. IN ACCORDANCE WITH TITLE 22, CCR, SECTION 66261.24(a)(2)(A),THE MCL IS 1 %. SAMPLES WERE NOT COLLECTED BY ASBESTECH. THIS REPORT MUST NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE APPROVAL OF ASBESTECH. THIS REPORT RELATES ONLY TO THE ITEMS TESTED. THIS REPORT MUST NOT BE USED TO CLAIM PRODUCT ENDORSEMENT BY N.V.L.A.P. OR ANY AGENCY OF THE U.S. GOVERNMENT. ASBESTECH ACCEPTS TECHNICAL RESPONSIBILITY FOR THIS REPORT AND DATE OF ISSUE.

NVLAP LAB CODE 101442-0 LAB DIRECTOR: TOM CONLON ANALYST: JIM JUNGLES

ENTEK

61825

BULK ASBESTOS MATERIAL *Analysis Request Form for*

ENTEK CONSULTING GROUP, INC.
4200 ROCKLIN ROAD, SUITE 7
ROCKLIN, CA 95677
(916) 632-6800
(916) 632-6812 FAX
mainoffice@entekgroup.com

Date of Sampling: 5-5-15

Job Number: 15-3531

Client Name: Blackburn Consulting

Site Address: I Street Bridge & Approaches
Sacramento, CA

Lab: Asbestech

Turnaround Time: Standard

Collected by: Jodi Smith

ANALYSIS REQUESTED: Asbestos by PLM with Dispersion Staining

Special Instruction:

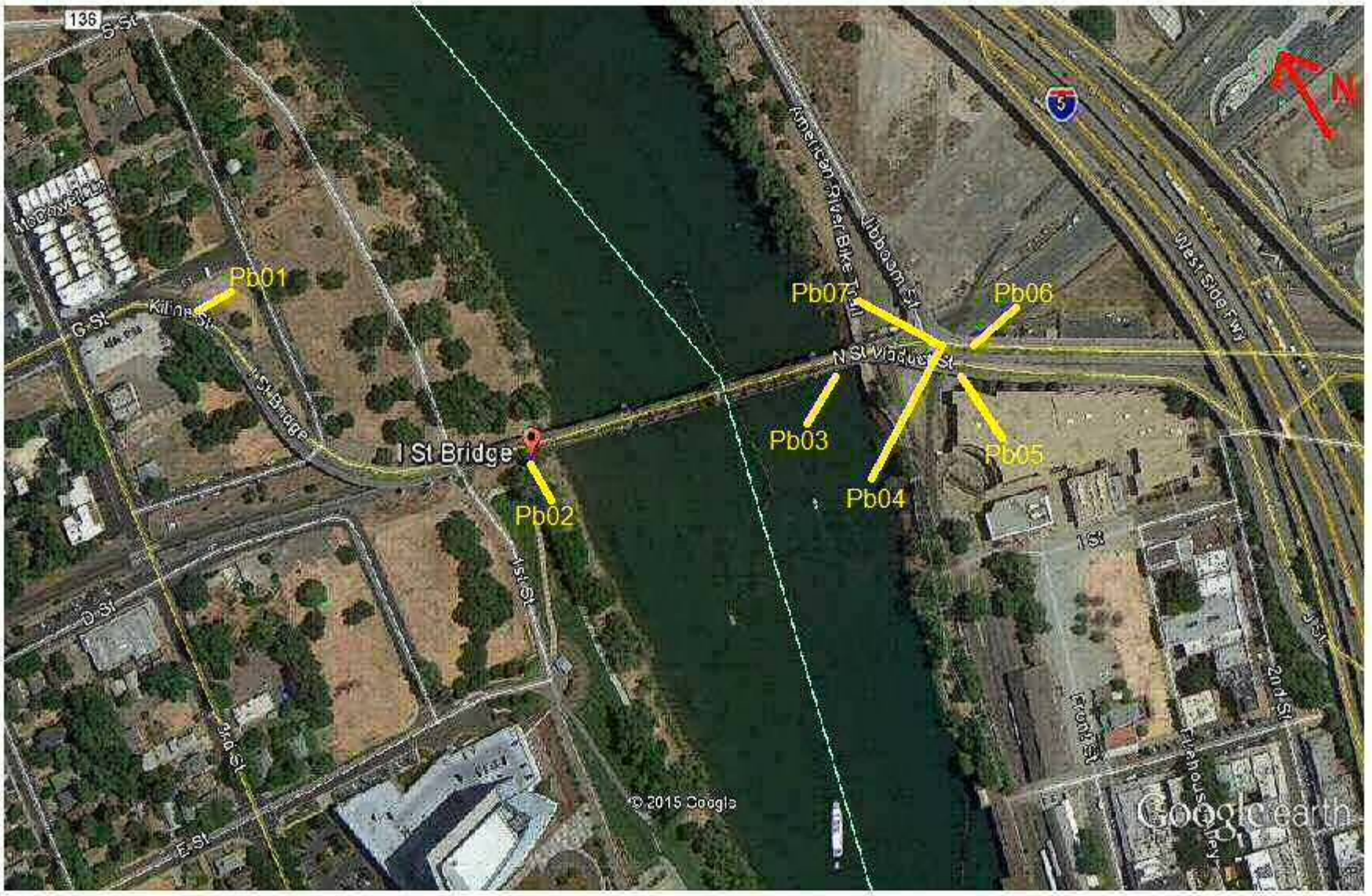
SAMPLE #	MATERIAL DESCRIPTION/LOCATION
15-3531-01A	Concrete, Western Approach, East Side
15-3531-01B	Concrete, Western Approach, West Side
15-3531-02A	Gasket Between Rail and Concrete Berm, Western Approach, East Side
15-3531-03A	Fastener & Rail Sealant, Western Approach, East Side
15-3531-04A	Silver Paint, Bridge, South Side
15-3531-05A	Concrete, Bridge, South Side
15-3531-05B	Concrete, Bridge, North Side
15-3531-06A	Walkway Pavement, Bridge, North Side
15-3531-07A	Concrete, Southeast Approach, South Side
15-3531-07B	Concrete, Southeast Approach, North Side
15-3531-08A	Gasket Between Rail and Concrete Berm, Southeast Approach, South Side
15-3531-09A	Concrete, Northeast Approach, South Side
15-3531-09B	Concrete, Northeast Approach, North Side
15-3531-10A	Gasket at Light Boxes, Northeast Approach, South Side

Z:\Clients\Blackburn Consulting\15-3531 I Street Bridge Replacment - Asb & Pb Survey\Bulk Sample Asb\Bulk Request 050715.wpd

Delivered by: _____ **Date:** 5/7/15 **Time:** 1025 hrs

Received by: _____ **Date:** 5/7/15 **Time:** 1025

Appendix B. Lead Related Documents



Sample Numbers are Preceded by 15-3531-

I Street Bridge West Sacramento, CA Entek Project Number 15-3531	Entek Consulting Group, Inc. 4200 Rocklin Road, Suite 7 Rocklin, California 95677 Map Not to Scale	Approximate Locations of Bulk Lead Samples Collected by Jodi Smith on May 5, 2015

ASBESTECH
6825 Fair Oaks Blvd., Suite 103
Carmichael, California 95608
Tel (916) 481-8902
Fax (916) 481-3975

FLAME ATOMIC ABSORPTION SPECTROMETRY
LEAD (Pb) IN PAINT SAMPLES
METHOD SW846-3050B-7420

CLIENT:
Entek Consulting Group, Inc.
4200 Rocklin Rd., Suite 7
Rocklin, CA 95677

CDPH ELAP#1153
ELPAT#101801

JOB I.D: 15-3531, Blackburn Consulting, I Street Bridge & Approaches, Sacramento, Ca

DATE RECEIVED: 5/8/15

DATE ANALYZED: 5/11/15

LAB JOB NO: 10424

DATE REPORTED: 5/11/15

SAMPLE DATE	SAMPLE NUMBER	DESCRIPTION	PPM	RESULT IN WT%	RL	Q.C. BATCH
5/5/15	ECG-15-3531-Pb01	Silver paint on metal rail, western approach	<50	<0.0050	0.0050%	56
5/5/15	ECG-15-3531-Pb02	Silver paint on metal, bridge	360000	36	0.0050%	56
5/5/15	ECG-15-3531-Pb03	Black paint on metal, bridge	110000	11	0.0050%	56
5/5/15	ECG-15-3531-Pb04	Yellow road striping, SE approach	<50	<0.0050	0.0050%	56
5/5/15	ECG-15-3531-Pb05	Silver paint on metal rail, SE approach	<50	<0.0050	0.0050%	56
5/5/15	ECG-15-3531-Pb06	White paint on metal rail, NE approach	20000	2.0	0.0050%	56
5/5/15	ECG-15-3531-Pb07	White road striping, SE approach	<50	<0.0050	0.0050%	56

Analytical results and reports are generated at the request and for the exclusive use of the client. This report applies only to the items tested. Samples were not collected by ASBESTECH. This report must not be reproduced except in full, and only with the express permission of ASBESTECH. This report must not be used to claim product endorsement by any agency of the U.S. Government.

LABORATORY DIRECTOR: TOM CONLON

ANALYST: JIM JUNGLES

10424

ENTEK

BULK LEAD MATERIAL *Analysis Request Form for*

ENTEK CONSULTING GROUP, INC.
4200 ROCKLIN ROAD, SUITE 7
ROCKLIN, CA 95677
(916) 632-6800
(916) 632-6812 FAX
mainoffice@entekgroup.com

Date of Sampling: 5-5-15

Lab: Asbestech

Job Number: 15-3531

Turnaround Time: Standard

Client Name: Blackburn Consulting

Collected by: Jodi Smith

Site Address: I Street Bridge & Approaches
Sacramento, CA

ANALYSIS REQUESTED: Lead by Atomic Absorption Spectrometry

Special Instruction: *Please report result in PPM and % by weight.*

$56

SAMPLE #	MATERIAL DESCRIPTION/LOCATION	
15-3531-Pb01	Silver Paint on Metal Rail, Western Approach	<
15-3531-Pb02	Silver Paint on Metal, Bridge	360000 / 36
15-3531-Pb03	Black Paint on Metal, Bridge	110000 / 11
15-3531-Pb04	Yellow Road Striping, Southeast Approach	<
15-3531-Pb05	Silver Paint on Metal Rail, Southeast Approach	<
15-3531-Pb06	White Paint on Metal Rail, Northeast Approach	20000 / 2.0
15-3531-Pb07	White Road Striping, Southeast Approach	<

Z:\Clients\Blackburn Consulting\15-3531 I Street Bridge Replacment - Asb & Pb Survey\Bulk Sample Pb\Bulk Request Pb 050715.wpd

Delivered by: _____ **Date:** 5/7/15 **Time:** 1025hrs.

Received by: _____ **Date:** 5/7/15 **Time:** 1025

Appendix C. Backup Documentation

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 101442-0

ASBESTECH

Carmichael, CA

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

BULK ASBESTOS FIBER ANALYSIS

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2014-07-01 through 2015-06-30

Effective dates

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

For the National Institute of Standards and Technology

NVLAP® National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

ASBESTECH
6825 Fair Oaks Blvd., Suite 103
Carmichael, CA 95608
Mr. Tommy Conlon
Phone: 916-481-8902 Fax: 916-481-3975
E-Mail: asbestech@sbcglobal.net
URL: http://www.asbestechlab.com

BULK ASBESTOS FIBER ANALYSIS (PLM) **NVLAP LAB CODE 101442-0**

NVLAP Code	*Designation / Description*
18/A01	EPA 600/M4-82-020: Interim Method for the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

2014-07-01 through 2015-06-30
Effective dates

For the National Institute of Standards and Technology

NVLAP-01S (REV. 2005-05-19)

LEAD HAZARD EVALUATION REPORT

Section 1 – Date of Lead Hazard Evaluation 5-5-15

Section 2–Type of Lead Hazard Evaluation (Check one box only)

❒ Lead Inspection ❒ Risk Assessment ❒ Clearance Inspection ■ Other (specify) See Attached Letter dated Dec. 1, 2008

Section 3–Structure Where Lead Hazard Evaluation Was Conducted

Address [number, street, apartment (if applicable)]	City	County	Zip Code
I Street Bridge	West Sacramento & Sacramento	Yolo & Sacramento	

Construction date (year) of structure	Type of structure (check one box only)
1910	❒ Multi-unit building ❒ School or daycare ❒ Single Family Dwelling ■ Other (specify) Bridge and Roadway Approaches

Section 4–Owner of Structure (If business/agency, list contact person)

Name	Telephone Number
Unknown, Inspection was conducted for Laura Long of Blackburn Consulting	916-375-8706

Address [number, street, apartment (if applicable)]	City	State	Zip Code
2491 Boatman Avenue	West Sacramento	CA	95691

Section 5–Results of Lead Hazard Evaluation (Check all that apply)

❒ No lead-based paint detected. ■ Lead-based paint detected.

❒ No lead hazards detected. ❒ Lead hazards detected.

Section 6–Individual Conducting Lead Hazard Evaluation

Name	Telephone Number
Entek Consulting Group, Inc. - Jodi Smith	(916) 632-6800

Address [number, street, apartment (if applicable)]	City	State	Zip Code
4200 Rocklin Road, Suite 7	Rocklin	CA	95677

CDPH certification number	Signature	Date
19230		5-11-15

Name and CDPH certification number of any other individuals conducting sampling or testing (if applicable)

N/A

Section 7–Attachments

A. A foundation diagram or sketch of the structure indicating the specific locations of each lead hazard or presence of lead-based paint;

B. Each testing method, device, and sampling procedure used;

C. All data collected, including quality control data, laboratory results, indicating laboratory name, address, and phone number.

First copy and attachments retained by inspector

Second copy and attachments retained by owner

Third copy only (no attachments) mailed to:

California Department of Public Health
Childhood Lead Poisoning Prevention Branch Reports
850 Marina Bay Parkway, Building P. Third Floor
Richmond, CA 94804-6403
FAX: (510) 622-5656

ENTEK CONSULTING GROUP, INC.
4200 Rocklin Road, Suite 7 Rocklin, CA 95677 Telephone (916) 632-6800 Fax (916) 632-6812

December 1, 2008

State of California
Health and Human Services Agency
California Department of Public Health
Childhood Lead Poisoning Prevention Branch Reports
850 Marina Bay Parkway, Building P, Third Floor
Richmond, CA 94804-6403

RE: Lead Hazard Evaluation Report (CDPH 8552 - 6/07)

To Whom it May Concern:

In a memorandum issued to all "California Department of Health Services Certified Inspector/Assessors and Project Monitors", by the State of California – Health and Human Services Agency, Department of Health Services (DHS), dated June 5, 2006, and signed by Mr. Paul Fitzmaurice, Chief, Lead Hazard Reduction Section, Childhood Lead Poisoning Prevention Branch, it was made clear that "... the on-site investigation, for compensation, of lead-based paint or lead hazards ..." includes "... conducting testing and/or sampling activities as part of a non- 'abatement' project (e.g. painting, remodeling, etc.)."

As a result of this directive, Entek Consulting Group, Inc. (Entek) is providing you with the current CDPH Form 8552 (6/07) documenting an inspection/assessment performed by Entek.

The investigation results being reported on the attached CDPH Form 8552 do not reflect a "Lead Inspection/Assessment" as defined in Title 17. As a result the "Other" box, in "Section 2 – Type of Lead Hazard Evaluation", is checked. This is being done to make it clear this investigation does not meet the definition of a "Lead Inspection/Assessment", and submission of the attached CDPH Form 8552 is not meant to reflect that it does.

CDPH Form 8552, Section 5 – Results of Lead Hazard Evaluation, does not allow for an appropriate option pertaining to the results of the investigation/assessment performed and being reported (i.e. for the purpose of compliance with Cal/OSHA, Title 8 1532.1. Lead), or an assessment being performed in an unregulated structure. While one of or more of the four boxes is checked to reflect the results of the inspection/assessment. The lead inspection/assessment was not required under Title 17.

This letter is not intended to disagree whether a CDPH Form 8552 must be submitted, but is for clarification as to the information included on the CDPH Form 8552, and its intended purpose, namely to reflect the goal of the services performed by Entek.

Sincerely,

Douglas R. Colley
V.P. Operations
CDPH Lead Certification #5785

Z:\FinalLetters\Lead Hazard Eval Disclaimer Let Updated 120108.wpd

CDPH
California Department of
PublicHealth

CALIFORNIA STATE

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM BRANCH

CERTIFICATE OF ENVIRONMENTAL LABORATORY ACCREDITATION

Is hereby granted to

Asbestech

6825 Fair Oaks Boulevard, Suite 103

Carmichael, CA 95608

Scope of the certificate is limited to the
"Fields of Testing"
which accompany this Certificate.

Continued accredited status depends on successful completion of on-site, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **1153**

Expiration Date: **03/31/2016**

Effective Date: **04/01/2014**

Richmond, California
subject to forfeiture or revocation

David Mazzera, Ph.D., Assistant Division Chief
Division of Drinking Water and Environmental Management

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

Asbestech
6825 Fair Oaks Boulevard, Suite 103
Carmichael, CA 95608
Phone: (916) 481-8902

Certificate No.: 1153
Renew Date: 3/31/2014

Field of Testing: 114 - Inorganic Chemistry of Hazardous Waste			
114.130	001	Lead	EPA 7420
Field of Testing: 115 - Extraction Test of Hazardous Waste			
115.021	001	TCLP Inorganics	EPA 1311
115.030	001	Waste Extraction Test (WET)	CCR Chapter11, Article 5, Appendix II
Field of Testing: 121 - Bulk Asbestos Analysis of Hazardous Waste			
121.010	001	Bulk Asbestos	EPA 600/M4-82-020

As of 3/22/2012 , this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

State of California
Division of Occupational Safety and Health
Certified Asbestos Consultant

Jodi L Smith
Name

Certification No. **08-4345**

Expires on **04/17/15**

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.

State of California Department of Public Health

Lead-Related Construction Certificate	Certificate Type	Expiration Date
	Inspector/Assessor	05/15/2015
	Supervisor	05/15/2015

Jodi L. Smith ID #: **19230**

West Sacramento Historical Society Document on the I Street Bridge

accessed on May 13, 2015 via
http://www.westsachistoricalsociety.org/userfiles/File/I%20Street%20Bridges.pdf

History of the I Street Bridge

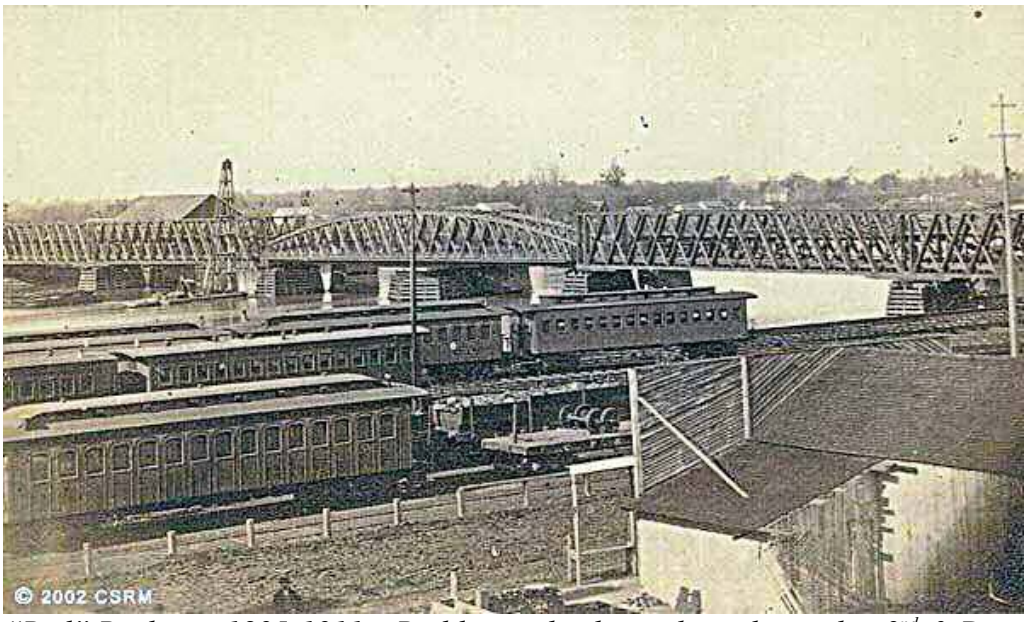
The first bridge across the Sacramento River at Sacramento was authorized by the State Legislature on April 3, 1857. It was a toll bridge of highway traffic only, and extended from Broad Street (now abandoned) Sacramento, to Ann Street (D Street) Washington, Yolo County. It was constructed by the Sacramento and Yolo Bridge Company, and was completed June 27, 1858.

The California Pacific Railroad Company (later consolidated into the Southern Pacific Railroad Company) in 1869 obtained a franchise to build a bridge 400 feet above the highway bridge, constructed by the Sacramento and Yolo Bridge Company, but as the California Pacific Railroad Company desired a location nearer Broad Street (now part of the S.P. Shop grounds at former China Lake), they built under the franchise of the Sacramento and Yolo Bridge Company.

The Sacramento River crossing from Washington was in process of construction December 29th, 1869, the date of the California Pacific consolidation with the SP.
This bridge carried the first railroad rack across the river. Trains entered Sacramento from the west on January 15, 1870. According to a newspaper report dated October 2nd, 1869, "It was the intention to build some 75 feet below the present location so as to pass into I street, but the Central Pacific Railroad Company raised objections, it has been decided to build as near to the old bridge as possible, and across the slough in entering the city." On February 8th 1878 another newspaper reported "Tolls of 1877 amounted to $9, 325, exclusive of railroad toll contract."

The S.P. purchased the bridge from the Sacramento and Yolo Bridge Company in 1878, and rebuilt it the same year, completing it December 5th 1878.

In 1893, the S.P. with the counties of Sacramento and Yolo began the construction of a joint bridge for railroad and highway use, which was completed in 1895 (Red Bridge). This bridge was situated about 300 feet down-stream or south off the present steel joint railroad-highway bridge, and consisted of a substructure of two piled abutments, five piled piers and seven dolphins. The eastern approach was a wooden viaduct for highway purposes. The side of incline was "E" Street in Washington.



"Red" Bridge 1895-1911 Building in backround was located at 2nd & D in Broderick.

Written by Frank Norton of Broderick year unknown (probably ca. 1960). Typed into MS Word document and photos added by Mickey Fausett

This bridge was removed as soon as traffic was routed over the new and present steel structure in 1911.

I St. Bridge ca. 1912 Looking East towards Sacramento (Photo taken from "dogleg" section.)

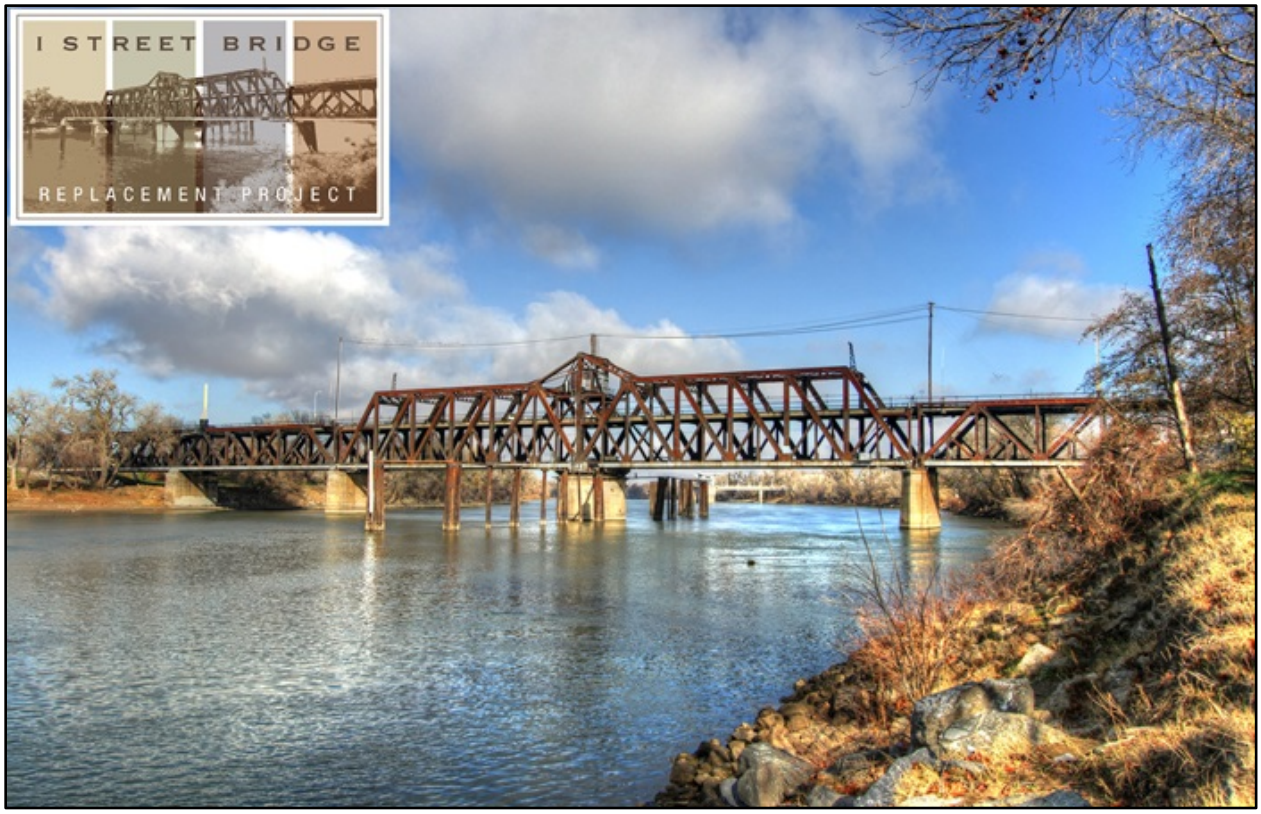
Because of increased vehicular traffic congestion on the bridge, a new sweeping approach to the Broderick side of the bridge was installed in 1959 by the state highway department. (Note: Present span)

Written by Frank Norton of Broderick year unknown (probably ca. 1960). Typed into MS Word document and photos added by Mickey Fausett

I Street Bridge Replacement Project

Sacramento and Yolo County, California

Location Hydraulic Study



Prepared for:

MARK THOMAS & COMPANY

Prepared by:

MBK ENGINEERS

August, 2016

I-Street Bridge Replacement Project
Sacramento and Yolo County, California

Location Hydraulic Study

Submitted to:
Mark Thomas & Company

This report has been prepared by, or under the supervision of, the following Registered Engineer. The Registered Civil Engineer attests to the technical information contained herein, and has judged the qualifications of any technical specialists, providing engineering data upon which recommendations, conclusions, and decisions are based.

Don Trieu, P.E. [Insert PE Stamp]

Date

FINAL DRAFT

LOCATION HYDRAULIC STUDY

1. **Location:**

   District: Caltrans District 3
   County: Sacramento and Yolo
   Route: N/A

2. **Geographical References:**

   United States Geological Survey – Topographic Quadrangle, West Sacramento, CA 38°35'22"N 121° 35' 22"W

3. **Name of Stream:**

   Sacramento River

4. **Floodplain Description:**

   According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Number 06067C0160J, the I-Street Replacement Bridge traverses Special Flood Hazard Area (SFHA) "Zone AE", associated with the Sacramento River.

   According to FEMA, Zone AE corresponds to the 1% probability of exceedance (i.e. 100-year) floodplain that is determined in the Flood Insurance Study (FIS) by detailed methods.

5. **Description of Project:**

   The proposed project would construct a new bridge over the Sacramento River between the Cities of Sacramento and West Sacramento to replace the vehicle crossing that is currently provided by the existing I-Street Bridge. The bridge would connect C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento.

   The bridge would be approximately 860-foot long, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides. The bridge would include two fixed-span approach structure that tie into the Sacramento and West Sacramento banks of the river. The center span of the bridge would be an approximately 330-foot movable span that meets the United States Coast Guard requirements.

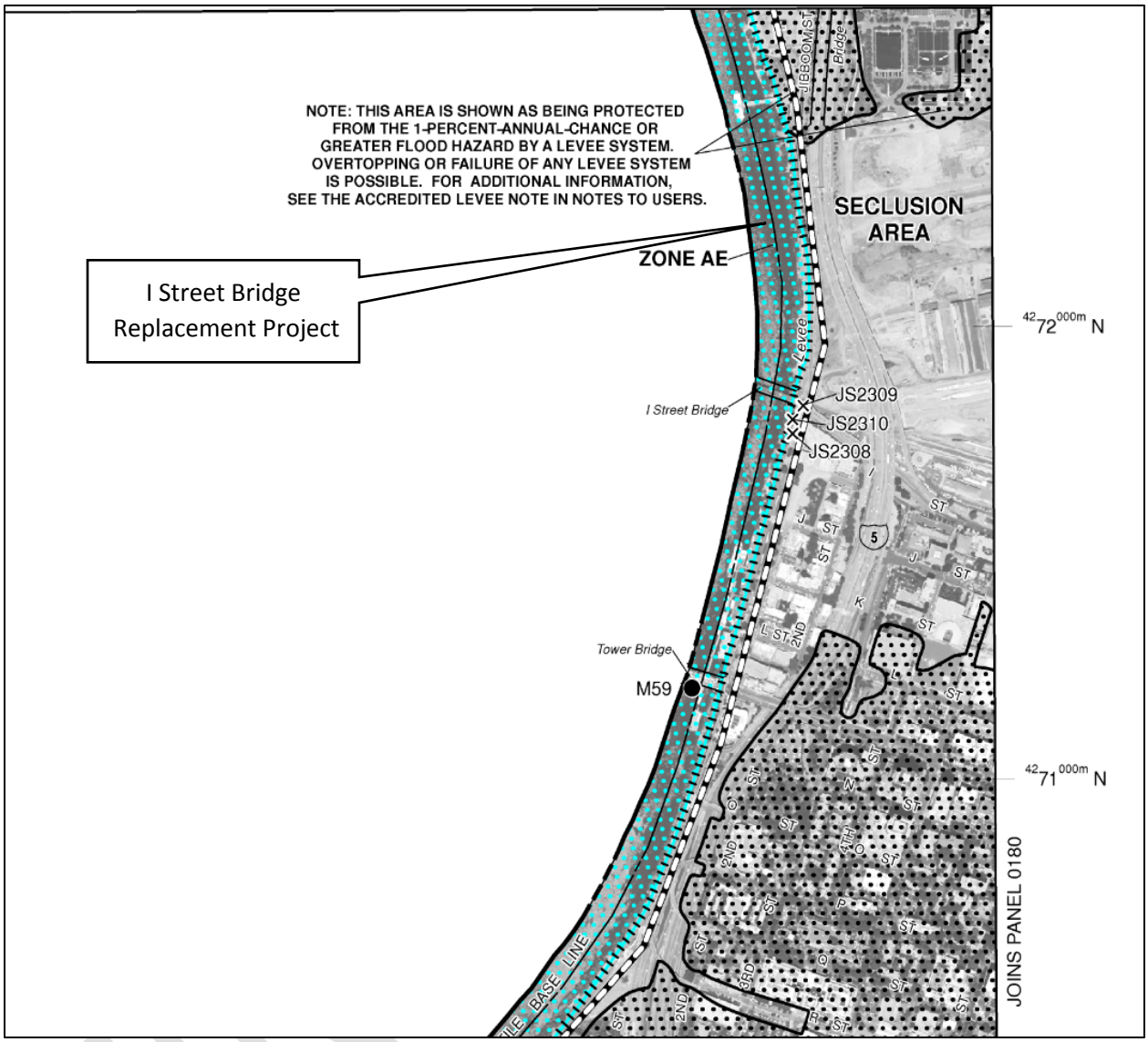
6. **Hydrologic:**

   Base Flood (Q100): Sacramento River – 120,000 cubic feet per second

   Water Surface Elevation for Base Flood: Sacramento River – 33.1 feet NAVD-88

FINAL DRAFT

7. Are National Flood Insurance Program (NFIP) maps and studies available?



Source: FEMA FIRM 06067C0160J, June 16, 2015

Figure 1 I-Street Bridge Replacement Project at Sacramento River (FIRM)

8. Is the highway location alternative within a regulatory floodway?

No. Although a detailed study was performed to establish the base flood elevations, a regulatory floodway was not determined for the Sacramento River.

9. Attach map with flood limits outlined showing all buildings or improvements within the base floodplain.

N/A

10. Base Flood Backwater Potential:

Residences	No
Other Buildings	Yes
Crops	No
Natural and Beneficial Floodplain Values	No

11. Traffic:

Current Average Daily Traffic (ADT)	12,730
Projected ADT (2040)	33,030
Emergency Supply or Evacuation Route	Yes
Emergency Vehicle Access	Yes
Practicable Detour Available	Yes
School Bus or Mail Route	Yes

12. Estimated duration of traffic interruption for base flood (Q100):

No traffic interruption is expected due to the base flood because the California Central Valley Flood Protection Board, California Code of Regulations Title 23, requires new bridge construction be designed with a minimum of 3 feet of freeboard, above the Sacramento River Flood Control Project Design (Design) floodplain. The Design floodplain at the project is 33.7 feet NAVD88, which is greater than the FEMA base flood elevation of 33.1 feet NAVD88.

13. Estimated value of base flood (Q100) flood damages:

There are no significant impacts to the existing floodplain, and no anticipated flood damages, because of the Project.
Roadway: $0
Property: $0
Total: $0

14. Assessment of Level of Risk:

Low

FINAL DRAFT

References

(Federal Emergency Management Agency, 2015). Flood Insurance Study. Sacramento County, California and Incorporated Areas. Community Number 06067CV004B. 2015.

(Federal Emergency Management Agency, 2015). Flood Insurance Rate Map. Sacramento County, California and Incorporated Areas. Map Number 06067C0160J. 2015.

FINAL DRAFT

Appendix A: Location Hydraulic Study Form

FINAL DRAFT

LOCATION HYDRAULIC STUDY FORM *

District: 3 County: Sacramento and Yolo Rte. N/A P.M. N/A

EA N/A Bridge No. 22C0153

Floodplain Description:

According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Number 06067C0160J, the I-Street Replacement Bridge traverses Special Flood Hazard Area (SFHA) "Zone AE" associated with the Sacramento River.

According to FEMA, Zone AE corresponds to the 1% probability of exceedance (i.e. 100-year) floodplain that is determined in the Flood Insurance Study (FIS) by detailed methods.

1. **Description of Proposal:**

   The proposed project would construct a new bridge over the Sacramento River between the Cities of Sacramento and West Sacramento to replace the vehicle crossing that is currently provided by the existing I-Street Bridge. The bridge would connect C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento.

   The bridge would be approximately 860-foot long, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides. The bridge would include two fixed-span approach structure that tie into the Sacramento and West Sacramento banks of the river. The center span of the bridge would be an approximately 330-foot movable span that meets the USCG requirements.

2. ADT: Current 12,730 Projected (2040) 33,030

3. **Hydraulic Data:** Base Flood Q100= 120,000 CFS

WSE100 = 33.1 feet NAVD-88

The flood of record, if greater than Q100:

Q = N/A CFS WSE = N/A

Overtopping flood Q = _____CFS WSE = _____

Are NFIP maps and studies available? YES

4. **Is the highway location alternative within a regulatory floodway?**

   YES_____ NO X

FINAL DRAFT

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

N/A

Potential Q100 backwater damages:

A.	Residences?	NO X	YES
B.	Other Bldgs?	NO X	YES
C.	Crops?	NO X	YES
D.	Natural and beneficial Floodplain values?	NO x	YES

6. Type of Traffic:

A. Emergency supply or evacuation route?	NO	YES X
B. Emergency vehicle access?	NO	YES X
C. Practicable detour available?	NO	YES X
D. School bus or mail route?	NO	YES X

7. Estimated duration of traffic interruption for 100-year event hours:

N/A

8. Estimated value of Q100 flood damages (if any) – moderate risk level.

A.	Roadway	$ 0
B	Property	$ 0
	Total	$ 0

9. Assessment of Level of Risk:

Low X

Moderate

High

FINAL DRAFT

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.

Signature: District Hydraulic Engineer _____ **Date**:_____

(Item numbers 3,4,5,7,9)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible floodplain development?

NO____X_____YES_____

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113.

Information developed to comply with the federal requirement for the Location Hydraulic Study shall be retained in the project files.

Signature: District Hydraulic Engineer _____ **Date**:_____

(Item numbers 1,2,6,8)

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Appendix B: Summary Floodplain Encroachment Report

FINAL DRAFT

SUMMARY FLOODPLAIN ENCROACHMENT REPORT*

District: 3 County: Sacramento and Yolo Rte. N/A_____ P.M. N/A_____

Project No.: N/A_____ Bridge No. 22C0153_____

Limits:
The proposed project would construct a new bridge over the Sacramento River, between the cities of Sacramento and West Sacramento, to replace the vehicle crossing that is currently provided by the existing I Street Bridge. The new bridge would connect C Street in the City of West Sacramento, to Railyards Boulevard in the City of Sacramento.

Floodplain Description:
According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Number 06067C0160J, the I-Street Replacement Bridge traverses Special Flood Hazard Area (SFHA) "Zone AE", associated with the Sacramento River.

According to FEMA, Zone AE corresponds to the 1% probability of exceedance (i.e. 100-year) floodplain that is determined in the Flood Insurance Study (FIS) by detailed methods.

		No	Yes
1.	Is the proposed action a longitudinal encroachment of the base floodplain?	**X**	
2.	Are the risks associated with the implementation of the proposed action significant?	**X**	
3.	Will the proposed action support probable incompatible floodplain development?	**X**	
4.	Are there any significant impacts on natural and beneficial floodplain values?	**X**	
5.	Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.	**X**	
6.	Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q)?	**X**	
7.	Are Location Hydraulic Studies that document the above answers on file? If not explain.	**X**	

FINAL DRAFT

PREPARED BY:

_____ _____
Signature: District Hydraulic Engineer **Date**

_____ _____
Signature: District Environmental Branch Chief **Date**

_____ _____
Signature: District Project Engineer **Date**

*** Same as Figure 804.7B Floodplain Evaluation Report Summary located in Chapter 804 of the Highway Design Manual**

FINAL DRAFT

LOCATION HYDRAULIC STUDY FORM

Dist. 3 Co. Sacramento and Yolo Rte. N/A Project ID. N/A
Federal-Aid Project Number: N/A

Floodplain Description:

According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Number 06067C0160J, the I-Street Replacement Bridge traverses Special Flood Hazard Area (SFHA) "Zone AE" associated with the Sacramento River.

According to FEMA, Zone AE corresponds to the 1% probability of exceedance (i.e. 100-year) floodplain that is determined in the Flood Insurance Study (FIS) by detailed methods.

1. Description of Proposal *(include any physical barriers i.e. concrete barriers, sound walls, etc. and design elements to minimize floodplain impacts)*

The proposed project would construct a new bridge over the Sacramento River between the Cities of Sacramento and West Sacramento to replace the vehicle crossing that is currently provided by the existing I-Street Bridge. The bridge would connect C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento.

The bridge would be approximately 860-foot long, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides. The bridge would include two fixed-span approach structure that tie into the Sacramento and West Sacramento banks of the river. The center span of the bridge would be an approximately 330-foot movable span that meets the United States Coast Guard requirements.

2. ADT: Current 12,730 Projected (2040) 33,030

3. Hydraulic Data: Base Flood Q100= 120,000 CFS
WSE100= 33.1 ft. NAVD-88 *The flood of record, if greater than Q100:*
Q= N/A CFS WSE= N/A
Overtopping flood Q= N/A CFS WSE= N/A

Are NFIP maps and studies available? NO_____ YES_X_

4. Is the highway location alternative within a regulatory floodway?
NO _____ YES_X_

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q100 backwater damages:

A.	Residences?	NO_X_	YES_____
B.	Other Bldgs?	NO_X_	YES_____
C.	Crops?	NO_X_	YES_____
D.	Natural and beneficial Floodplain values?	NO_X_	YES_____

"Natural and beneficial flood-plain values" shall include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

6. Type of Traffic:

A.	Emergency supply or evacuation route?	NO_____ YES_X_
B.	Emergency vehicle access?	NO_____ YES_X_

C. Practicable detour available? NO_____YES__X____
D. School bus or mail route? NO_____YES__X____

7. Estimated duration of traffic interruption for 100-year event hours:__N/A__

8. Estimated value of Q100 flood damages (if any) – moderate risk level.

A.	Roadway	$__0__
B	Property	$__0__
	Total	$__0__

9. Assessment of Level of Risk Low__X__
Moderate_____
High_____

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.

LOCATION HYDRAULIC STUDY FORM cont.

Dist. 3 Co. Sacramento and Yolo Rte. N/A P.M. N/A
Federal-Aid Project Number: N/A
Project ID N/A Bridge No. 22C0153

PREPARED BY:

Signature:
I certify that I have conducted a Location Hydraulic Study consistent with 23 CFR 650 and that the information summarized in items numbers 3, 4, 5, 8, and 9 of this form is accurate.

_____ *Date* _____
District Hydraulic Engineer *(capital and 'on' system projects)*

_____ *Date* 8/26/2016
Local Agency/Consulting Hydraulic Engineer *(local assistance projects)*

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible Floodplain development? NO___X___YES_____

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

I certify that item numbers 1, 2, 6 and 7 of this Location Hydraulic Study Form are accurate and will ensure that Final PS&E reflects the information and recommendations of said report:

_____ *Date* _____
District Project Engineer *(capital and 'on' system projects)*

Date: 2016.08.31 14:26:53 -07'00' *Date* _____ SIGN HERE
Local Agency Project Engineer *(local assistance projects)*

CONCURRED BY:
I have reviewed the quality and adequacy of the floodplain submittal consistent with the attached checklist, and concur that the submittal is adequate to meet the mandates of 23 CFR 650.

_____ *Date* _____
District Project Manager *(capital and 'on' system projects)*

Date: 2016.08.31 14:27:12 -07'00' *Date* _____ SIGN HERE
Local Agency Project Manager *(Local Assistance projects)*

_____ *Date* 11.09.2016
District Local Assistance Engineer *(or District Hydraulic Branch for very complex projects or when required expertise is unavailable. Note: District Hydraulic Branch review of local assistance projects shall be based on reasonableness and concurrence with the information provided).*

I concur that the natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

Laura Loffler *Date* 10/10/16
District Senior Environmental Planner *(or Designee)*

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.

SUMMARY FLOODPLAIN ENCROACHMENT REPORT

Dist. 3 Co. Sacramento and Yolo Rte. N/A K.P. N/A
Federal-Aid Project Number *(Local Assistance)* N/A
Project No: N/A Bridge No. 22C0153
Limits:

The proposed project would construct a new bridge over the Sacramento River, between the cities of Sacramento and West Sacramento, to replace the vehicle crossing that is currently provided by the existing I Street Bridge. The new bridge would connect C Street in the City of West Sacramento, to Railyards Boulevard in the City of Sacramento.

Floodplain Description:

According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Number 06067C0160J, the I-Street Replacement Bridge traverses Special Flood Hazard Area (SFHA) "Zone AE", associated with the Sacramento River.

According to FEMA, Zone AE corresponds to the 1% probability of exceedance (i.e. 100-year) floodplain that is determined in the Flood Insurance Study (FIS) by detailed methods.

		No	Yes
1.	Is the proposed action a longitudinal encroachment of the base floodplain?	_X_	___
2.	Are the risks associated with the implementation of the proposed action significant?	_X_	___
3.	Will the proposed action support probable incompatible floodplain development?	_X_	___
4.	Are there any significant impacts on natural and beneficial floodplain values?	_X_	___
5.	Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.	_X_	___
6.	Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).	_X_	___
7.	Are Location Hydraulic Studies that document the above answers on file? If not explain.	___	_X_

PREPARED BY:

_____ *Date* _____
District Project Engineer *(capital and 'on' system projects)*

_____ Date: 2016.08.31 14:27:29 -07'00' *Date* _____
Local Agency Project Engineer *(local assistance projects)*

SIGN HERE

MBK ENGINEERS

CONCURRED BY:

_____ *Date* _____

District Project Manager *(capital and 'on' system projects)*

_____ *Date* 11.09.2016

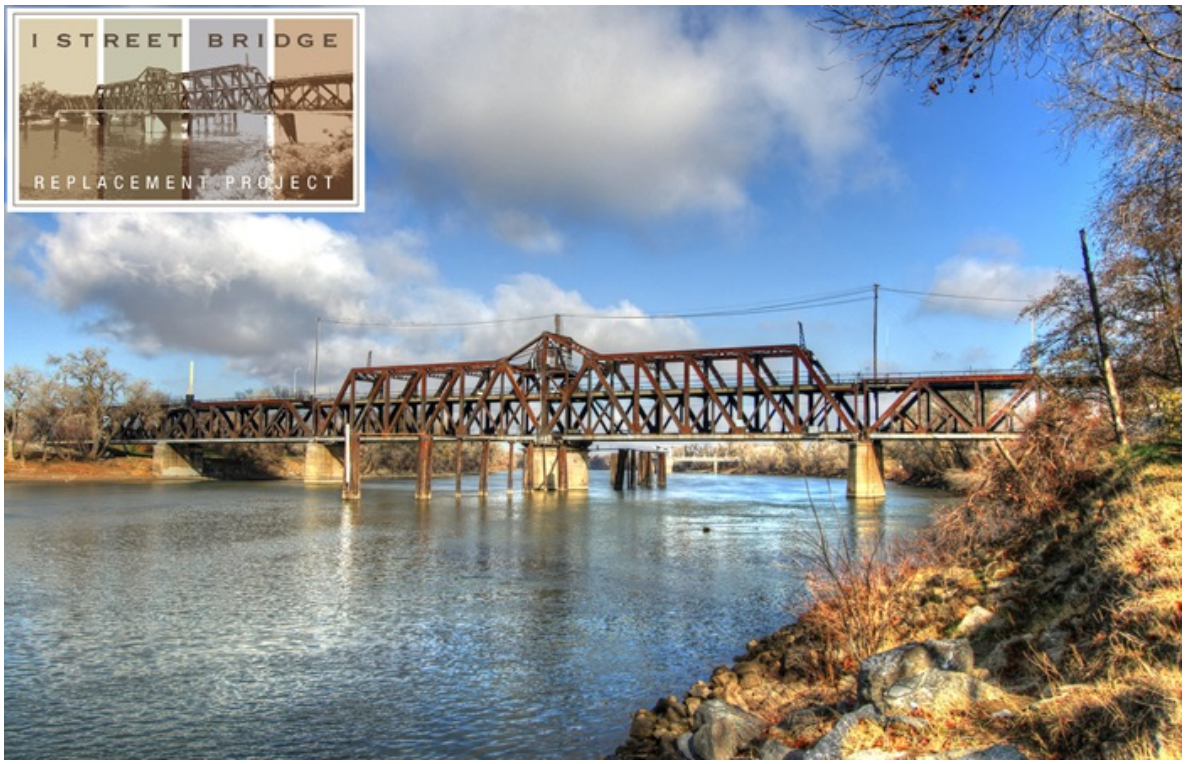
District Local Assistance Engineer *(Local Assistance projects)*

I concur that impacts to natural and beneficial floodplain values are consistent with the results of other studies prepared pursuant to 23 CFR 771, and that the NEPA document or determination includes environmental mitigation consistent with the Floodplain analysis.

_____ *Date* 11/10/16

District Senior Environmental Planner *(or Designee)*

Note: If a significant floodplain encroachment is identified as a result of floodplains studies, FHWA will need to approve the encroachment and concur in the Only Practicable Alternative Finding.



Natural Environment Study

I Street Bridge Replacement Project

Sacramento and Yolo Counties

Federal Project No.: BRLS 5002(164)

February 2016

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

For individuals with sensory disabilities, this document can be made available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Gilbert Mohtes-Chan, Public Information Office, California Department of Transportation, 703 B St., Marysville, CA 95901; (530) 741-4572. Voice, or use the California Relay Service TTY number, 711

Natural Environment Study

I Street Bridge Replacement Project
Sacramento and Yolo Counties
Federal Project No.: BRLS 5002(164)

February 2016

Prepared By: _____ Date: February 23, 2016

John Howe, Jeff Kozlowski, and Lisa Webber
Wildlife, Fish, and Plant Biologists
916-737-3000
630 K Street, Suite 500, Sacramento, CA 95814
ICF International, Sacramento Office

Recommended for Approval By: Jennifer Osmondson Date: 2/25/16

Jennifer Osmondson, Biologist
530-740-4807
North Region Environmental Planning M-1
Caltrans, District 3

Approved By: Susan D. Bauer Date: 2-25-16

Susan D. Bauer, Branch Chief
530-741-7113
North Region Environmental Planning M-1
Caltrans, District 3

Summary

S.1 Project Description

The City of Sacramento, in cooperation with the City of West Sacramento and the California Department of Transportation (Caltrans), proposes to construct a new bridge over the Sacramento River to replace the vehicle crossing that is currently accommodated by the existing I Street Bridge in order to remove a series of functionally obsolete or structurally deficient bridges (i.e., approach structures). The new connection also would reduce future traffic congestion, improve operations and safety, serve multiple modes of transportation, and comply with current American Association of State Highway and Transportation Officials, Caltrans, and local agency design standards.

One alignment is proposed for the new bridge over the Sacramento River. A new approximately 860-foot bridge, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides, is proposed. The bridge would include two fixed-span approach structures, approximately 200 feet and 270 feet in length, that tie into the Sacramento and West Sacramento banks of the river, respectively. The center span of the bridge would be an approximately 330-foot movable span that meets the USCG requirements. Roadway improvements on Railyards Boulevard in Sacramento and C Street in West Sacramento also are proposed. In both Sacramento and West Sacramento, two alternatives for portions of the roadway design are being considered.

- City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection
  - Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive
  - Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive

In the City of Sacramento, Alternative 1 consists of a signalized intersection at Jibboom Street and Bercut Drive, while Alternative 2 consists of a roundabout between these two intersections. Beyond the Jibboom Street and Bercut Drive intersections, the remaining project elements and limits in the City of Sacramento are similar under both alternatives.

- City of West Sacramento Residential Access
  - Alternative 1—C Street Connection to B Street
  - Alternative 2—C Street Connection to 3rd Street

In the City of West Sacramento, the proposed C Street alignment would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. Two alternatives are proposed for maintaining access to these parcels. Alternative 1 would construct a new connection to C Street, approximately 150 feet east of the C Street/3rd Street intersection,

that would extend north to B Street and then ultimately connect to the 3rd Street/B Street intersection. Alternative 2 would connect to the same location at C Street as Alternative 1, approximately 150 feet east of the C Street/3rd Street intersection, but would continue north approximately 300 feet, then make a 90-degree left turn, and connect to 3rd Street approximately 300 feet north of C Street.

S.2 Project Purpose and Need

The purpose of the project is to construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge from C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento. The project is needed in order to remove a series of functionally obsolete or structurally deficient bridges, consistent with the adopted findings of the Sacramento River Crossings Alternatives Study for Bridge Location 2 in the North Market Area.

S.3 Summary of Impact on Natural Communities of Special Concern

Three types of natural communities of special concern were identified and mapped in the biological study area (BSA), including cottonwood riparian forest, riparian forest/shrub wetland, and perennial stream (Sacramento River). Riparian forest/shrub wetland and perennial stream also are considered waters of the United States and waters of the state. The temporary and permanent impacts on natural communities of special concern are summarized in Table S-1.

Table S-1. Permanent and Temporary Impacts on Land Cover Types in the Biological Study Area[a]

	Proposed Project with West Sacramento Residential Access Alternative 1[a]		Proposed Project with West Sacramento Residential Access Alternative 2[a]	
Land Cover Type	**Permanent and Indirect Impact Area (acres)**	**Temporary Impact Area (acres)**	**Permanent and Indirect Impact Area (acres)**	**Temporary Impact Area (acres)**
Cottonwood riparian forest[b]	2.49	1.93	1.45	1.66
Riparian forest/shrub wetland[b]	0.07	0.11	0	0
Perennial drainage[b]	1.85	0.10	1.85	0.10
Ruderal woodland	2.01	1.70	2.01	1.70
Landscaped	0.63	0.70	0.54	0.63
Developed/graded	8.18	6.55	7.70	6.36
Total	**15.23**	**11.09**	**13.55**	**10.45**

[a] There are no differences in impact acreage as a result of the City of Sacramento roadway design alternatives.
[b] These are natural communities of special concern.

S.4 Summary of Impacts on Special-Status Species

S.4.1 Special-Status Plants

The proposed project would not have the potential to affect special-status plant species based on the negative results of appropriately timed botanical surveys, the absence of suitable microhabitat (i.e., soil types), and species' elevation range requirements that are substantially higher than the elevation of the BSA.

S.4.2 Special-Status Wildlife

The following potential impacts on special-status wildlife species could result from project construction.

- All alternatives would result in direct effects to five elderberry shrubs that represent habitat for the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (a species federally listed as threatened), which also could result in injury to or mortality of beetles.
- Western pond turtles (*Emys marmorata*) (a California species of special concern) could be injured or killed by construction equipment and activities under all alternatives. Construction noise or activity could disturb turtles or cause them to avoid the BSA.
- All alternatives could result in the potential loss or disturbance of nesting Swainson's hawks (*Buteo swainsoni*) (a species state listed as threatened) and white-tailed kite (*Elanus leucurus*) (a species fully protected by the California Fish and Game Code) from construction noise and activity, if nesting in or near the BSA.
- All alternatives would result in the loss of nesting habitat for purple martin (*Progne subis*) (designated as a California species of special concern) on the approach structure leading from the I Street Bridge east to J Street.
- Construction activities under all alternatives, such as approach structure removal, tree removal and trimming, and construction noise and vibrations, could result in direct effects on western red bat and pallid bat (designated as California species of special concern), including the destruction of active roosts, loss of roosting habitat, loss of individuals, or roost failure.

S.4.3 Special-Status Fish

The following potential impacts on special-status fish species could result from project construction:

- Potential adverse effects on Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run Chinook salmon (*O. tshawytscha*), Central Valley fall/late fall–run Chinook salmon (*O. tshawytscha*), Central Valley steelhead (*O. mykiss*), North American green sturgeon (*Acipenser medirostris*), Delta smelt (*Hypomesus*

transpacificus), longfin smelt (*Spirinchus thaleichthys*), Sacramento splittail (*Pogonichthys macrolepidotus*), and river lamprey (*Lampetra ayresii*) from underwater noise produced by pile driving and other in-water activities, increased turbidity and sedimentation, and potential discharges of contaminants.

- Temporary loss of aquatic habitat (substrate and water column) during construction for all fish species from temporary trestle piles and cofferdams (i.e., up to 4,197 square feet [0.095 acre] of substrate habitat and up to 77,213 cubic feet of water column habitat below the ordinary high water mark [OHWM]).
- Permanent loss of aquatic habitat (substrate and water column) for all fish species equal to the cumulative substrate area and water column habitat removed and displaced, respectively, from installing the new bridge piers (piers 2–5), rock slope protection (RSP), and piles for the new bridge fender system (i.e., up to 80,449 square feet [1.85 acre] of bank and substrate habitat and up to 32,650 cubic feet of water column habitat below the OHWM).
- Permanent loss of up to 890 linear feet of shaded riverine aquatic (SRA) cover vegetation (up to 513 linear feet on the City of Sacramento side of the Sacramento River and up to 377 linear feet on the City of West Sacramento side of the Sacramento River).
- Creation of approximately 55,000 square feet (1.26 acre) of permanent over-water structure (shade) on the Sacramento River where no over-water structure currently exists.
- Temporary adverse effects on designated critical habitat for Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, North American green sturgeon, and Delta smelt from underwater noise, temporary impacts on aquatic habitat (substrate and water column) associated with temporary trestle piles and cofferdam installation and removal, temporary water quality impacts on the water column during in-water construction, net permanent adverse effects on the channel substrate and water column from new bridge piers, and net permanent gain in overwater structure (shade) on aquatic habitat in the Sacramento River.
- Potential temporary and permanent adverse effects on Essential Fish Habitat for Pacific salmon (Chinook salmon) from underwater noise, temporary impacts on aquatic habitat (substrate and water column) associated with temporary trestle piles and cofferdam installation and removal, temporary water quality impacts on the water column during in-water construction, net permanent adverse effects on the channel substrate and water column from new bridge piers, and net permanent gain in overwater structure (shade) on aquatic habitat in the Sacramento River.

S.5 Other Protected and Managed Biological Resources

S.5.1 Migratory Birds

All alternatives could result in the potential loss or disturbance of migratory birds from construction noise and activity, if nesting in or near the BSA.

S.5.2 Bats

Construction activities under all alternatives, such as approach structure removal, tree removal and trimming, and construction noise and vibrations, could result in direct effects on roosting bats, including the destruction of active roosts, loss of roosting habitat, loss of individuals, or roost failure.

S.5.3 Protected Trees

Under all alternatives, the proposed project would result in the removal of up to 93 trees that meet the criteria for the City of Sacramento Heritage Tree Ordinance or the City of West Sacramento Tree Preservation Ordinance.

S.5.4 Invasive Plants

The proposed project has the potential to introduce and spread invasive plant species to uninfected areas within and adjacent to the BSA. This would be of particular concern for natural communities of special concern, where non-native invasive plants could outcompete and replace native vegetation.

S.6 Permits Required

The following applicable federal and state permits and approvals could be required before construction of the proposed project. [1]

- Endangered Species Act Section 7: Consultation and Incidental Take Statement (USFWS and NMFS)
- Executive Order 11990: Protection of Wetlands (USFWS)
- Executive Order 12962: Recreational Fisheries (NOAA/NMFS)
- Executive Order 13112: Prevention and Control of Invasive Species (USFWS)
- Executive Order 13186: Migratory Bird Treaty Act (USFWS)
- Magnuson-Stevens Fishery Conservation and Management Act (NMFS)
- Clean Water Act Section 404: Permit for Placement of Fill (USACE)
- Clean Water Act Section 401: Water Quality Certification (Central Valley RWQCB)

[1] CDFW = California Department of Fish and Wildlife, NMFS = National Marine Fisheries Service, NOAA = National Oceanic and Atmospheric Administration, RWQCB = Regional Water Quality Control Board, SLC = State Lands Commission, USACE = U.S. Army Corps of Engineers, USCG = U.S. Coast Guard, USFWS = U.S. Fish and Wildlife Service

- Rivers and Harbors Act of 1899 Section 10: Permit for Work in Navigable Waters (USACE)
- Rivers and Harbors Act of 1899 Section 9 and General Bridge Act of 1946: Bridge permit (USGC)
- California Endangered Species Act Incidental Take Permit (possible) (CDFW)
- California Fish and Game Code Section 1602: Streambed Alteration Agreement (CDFW)
- California Fish and Game Code Sections 3503 and 3503.5: Birds and Raptors (CDFW)
- California Fish and Game Code Section 3513: Migratory Birds (CDFW)
- California Fish and Game Code Sections 3511, 4700, 5050, and 5515: Fully Protected Species (CDFW)
- California Code of Regulations Title 2 § 2002: Land Use Lease (SLC)
- City of West Sacramento Tree Permit

S.7 Mitigation Agreements

As part of the proposed project, the project proponent or their contractor will implement the avoidance, minimization, and compensation measures listed below (described in more detail in Chapter 4). These measures have been identified on the basis of natural resources that are present in, or have the potential to occur in or near, the BSA and the potential impacts that could result from the proposed project.

- Measure 1: Install Orange Construction Fencing between the Construction Area and Adjacent Sensitive Biological Resources
- Measure 2: Conduct Environmental Awareness Training for Construction Employees
- Measure 3: Conduct Periodic Biological Monitoring
- Measure 4: Compensate for Temporary Effects to and Permanent Loss of Cottonwood Riparian Forest (including SRA Cover)
- Measure 5: Protect Water Quality and Prevent Erosion and Sedimentation in Drainages and Wetlands
- Measure 6: Compensate for Permanent Loss of Riparian Forest/Shrub Wetland
- Measure 7: Compensate for Loss of Perennial Stream
- Measure 8: Avoid and Minimize Impacts on Valley Elderberry Longhorn Beetle
- Measure 9: Transplant Elderberry Shrubs That Cannot Be Avoided
- Measure 10: Compensate for Impacts on Valley Elderberry Longhorn Beetle Habitat
- Measure 11: Conduct Preconstruction Surveys for Western Pond Turtle and Allow Turtles to Leave Work Area Unharmed
- Measure 12: Conduct Focused Surveys for Nesting Swainson’s Hawk prior to Construction
- Measure 13: Conduct Tree Removal during Non-Sensitive Periods for Wildlife

- Measure 14: Monitor Active Swainson's Hawk Nests during Pile Driving and other Construction Activities
- Measure 15: Conduct Preconstruction Surveys for Nesting Migratory Birds, Including Special-Status Birds, and Establish Protective Buffers
- Measure 16: Avoid and Minimize Impacts on Purple Martins during Construction Activities
- Measure 17: Avoid and Minimize Impacts on Nesting Birds and Roosting Bats from Demolition of Approach Structures
- Measure 18: Create Purple Martin Replacement Habitat
- Measure 19: Implement a Monitoring and Management Plan for Purple Martins
- Measure 20: Conduct Preconstruction Surveys for Roosting Bats and Implement Protective Measures
- Measure 21: Replace Bat Roosting Habitat Lost from Demolition of Approach Structures
- Measure 22: Monitor Bat Replacement Habitat
- Measure 23: Conduct All In-Water Construction Activities between May 1 and November 30 and during Daylight Hours Only
- Measure 24: Implement Measures to Minimize Exceedance of Interim Threshold Sound Levels during Pile Driving
- Measure 25: Develop and Implement a Hydroacoustic Monitoring Plan
- Measure 26: Monitor Turbidity in the Sacramento River
- Measure 27: Implement Cofferdam Restrictions
- Measure 28: Prepare and Implement a Fish Rescue and Relocation Plan
- Measure 29: Prevent the Spread or Introduction of Aquatic Invasive Species
- Measure 30: Minimize or Avoid Temporary Construction Lighting and Permanent Bridge Lighting from Directly Radiating on Water Surfaces of the Sacramento River
- Measure 31: Purchase Channel Enhancement Credits for Impacts on Critical Habitat
- Measure 32: Compensate for Loss of Protected Trees not in Riparian Habitat
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List of Abbreviated Terms

°C	degrees Celsius
°F	degrees Fahrenheit

A

ADA	Americans with Disabilities Act
AIS	aquatic invasive species

B

BA	Biological Assessment
Basin Plans	Water Quality Control Basin Plans
BMPs	best management practices
BSA	biological study area

C

Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CCV	California Central Valley
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
Central Valley Subprovince	Sacramento-San Joaquin Province
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CIDH	cast-in-drill-hole
CISS	cast-in-steel-shell
cm	centimeters
CNDDB	California Natural Diversity Database
CNPPA	California Native Plant Protection Act
CNPS	California Native Plant Society
CVFPB	Central Valley Flood Protection Board
CVFPP	Central Valley Flood Protection Plan
CVP	Central Valley Project
CWA	Clean Water Act

D

dB RMS	decibels root mean square
dbh	diameter at breast height
DCC	Delta Cross Channel
Delta	Sacramento–San Joaquin River Delta
DJFMP	Delta Juvenile Fish Monitoring Program
DPS	Distinct Population Segment
DWR	California Department of Water Resources
DWSC	Deep Water Ship Channel

E

EFH	essential fish habitat
EIR	Environmental Impact Report
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	federal Endangered Species Act
ESU	Evolutionarily Significant Unit

F

FHWA	Federal Highway Administration
FHWG	Fisheries Hydroacoustic Working Group
FR	Federal Register
FRFH	Feather River Fish Hatchery

G

Guidelines	Conservation Guidelines for the Valley Elderberry Longhorn Beetle

H

HBP	Highway Bridge Program
HUC	hydrologic unit code

I

I-5	Interstate 5
ICF	ICF International
ILF	in-lieu fee
ISAC	Invasive Species Advisory Committee

L

LSAA	Lake or Streambed Alteration Agreement
LSNFH	Livingston Stone National Fish Hatchery

M

MBTA	Migratory Bird Treaty Act
mm	millimeters
MOU	memorandum of understanding
MSA	Magnuson-Stevens Fishery Management and Conservation Act
MTP	Metropolitan Transportation Plan

N

NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NISC	National Invasive Species Council
NMFS	National Marine Fisheries Service
NPDES	Pollutant Discharge Elimination System
NTUs	nephelometric turbidity units

O

OHWM	ordinary high water mark

P

PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PES	Preliminary Environmental Study
POD	pelagic organism decline
ppt	parts per thousand

R

RBDD	Red Bluff Diversion Dam
RHA	River and Harbors Appropriation Act of 1899
RM	River Mile
RSP	rock slope protection
RWQCB	Regional Water Control Board

S

SACOG	Sacramento Area Council of Governments
SAM	Standard Assessment Methodology
SCS	Sustainable Communities Strategy
SEL	sound exposure level
SLC	State Lands Commission
SPL	sound pressure level
SRA	shaded riverine aquatic
State Water Board	State Water Resources Control Board
SWP	State Water Project
SWPPP	stormwater pollution prevention plan

T

TNW	traditional navigable water

U

ULDC	Urban Levee Design Criteria
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

V

VELB	Valley elderberry longhorn beetle

W

WDRs	waste discharge requirements

Chapter 1 Introduction

The City of Sacramento, in cooperation with the City of West Sacramento and the California Department of Transportation (Caltrans), proposes to construct a new bridge over the Sacramento River to replace the vehicle crossing that is currently accommodated by the existing I Street Bridge in order to remove a series of functionally obsolete or structurally deficient bridges (i.e., approach structures). The new connection also would reduce future traffic congestion, improve operations and safety, serve multiple modes of transportation, and comply with current American Association of State Highway and Transportation Officials, Caltrans, and local agency design standards.

The project is subject to state and federal environmental review requirements because of use of federal Highway Bridge Program (HBP) funds from the Federal Highway Administration (FHWA). Accordingly, project documentation is being prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The City of Sacramento is the lead agency under CEQA, with the City of West Sacramento as a responsible agency, and Caltrans is the lead agency under NEPA. The FHWA's other responsibilities for environmental review, consultation, and any other action required in accordance with applicable federal laws for this project will be carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S. Code (USC) 327.

This project is included in the Sacramento Area Council of Governments (SACOG) 2035 *Metropolitan Transportation Plan/Sustainable Communities Strategy* (MTP/SCS).

The proposed project is located over the Sacramento River between the cities of Sacramento and West Sacramento, approximately 1,000 feet north of the existing I Street Bridge (Figure 1-1). The project limits starting within the City of Sacramento consist of Railyards Boulevard from 200 feet east of Bercut Drive on the east, continuing west over the Sacramento River into the City of West Sacramento along C Street, and terminating approximately 100 feet west of the 5th Street intersection. The project limits also extend along Bercut Drive approximately 500 feet north of Railyards Boulevard, along Jibboom Street 550 feet north of Railyards Boulevard and 300 feet south of Railyards Boulevard, along 3rd Street 50 feet north and south of C Street, along 4th Street 50 feet north and south of C Street, and along 5th Street 50 feet north and south of C Street. The total length of the project is approximately 0.42 mile along C Street and Railyards Boulevard.

1.1 Project History

1.1.1 Purpose and need

The proposed project would construct a new bridge over the Sacramento River between the cities of Sacramento and West Sacramento to replace the vehicle crossing that is currently provided by the existing I Street Bridge. Construction of the proposed project has independent utility; the project is not dependent on other projects or improvements to meet the purpose and need.

Termini for the proposed project were developed through an iterative process involving engineering design and traffic operations analysis. Preliminary design concepts were tested with the traffic operations analysis model to evaluate how lane configurations influenced peak-hour conditions.

1.1.1.1 Purpose

The purpose and objectives of the project are listed below.

- The project should construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge from C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento, consistent with the adopted findings of the Sacramento River Crossings Alternatives Study for Bridge Location 2 in the North Market Area.
- The new bridge should meet the requirements of the Neighborhood Friendly Bridge definition that the City of Sacramento City Council adopted by resolution on October 18, 2011, which is defined by the following elements.
  - A facility whose primary function is local connectivity rather than regional travel and primarily serves short local trips.
  - A bridge which serves all users, including motorists, bicyclists, pedestrians, low energy vehicles, and public transit riders.
  - A bridge with aesthetics and dimensions which are architecturally pleasing and contextually appropriate for the adjacent neighborhoods.
  - A bridge that does not exceed or expand the already-planned capacity of the approach roadways (i.e., no widening of approaches just to accommodate bridge flows).
  - A facility which is designed with a target speed equal to or less than the approach roadways.
  - A bridge which reduces the growth in vehicle miles traveled in the adjacent communities.
  - A bridge that does not connect directly to streets which are primarily residential in character.

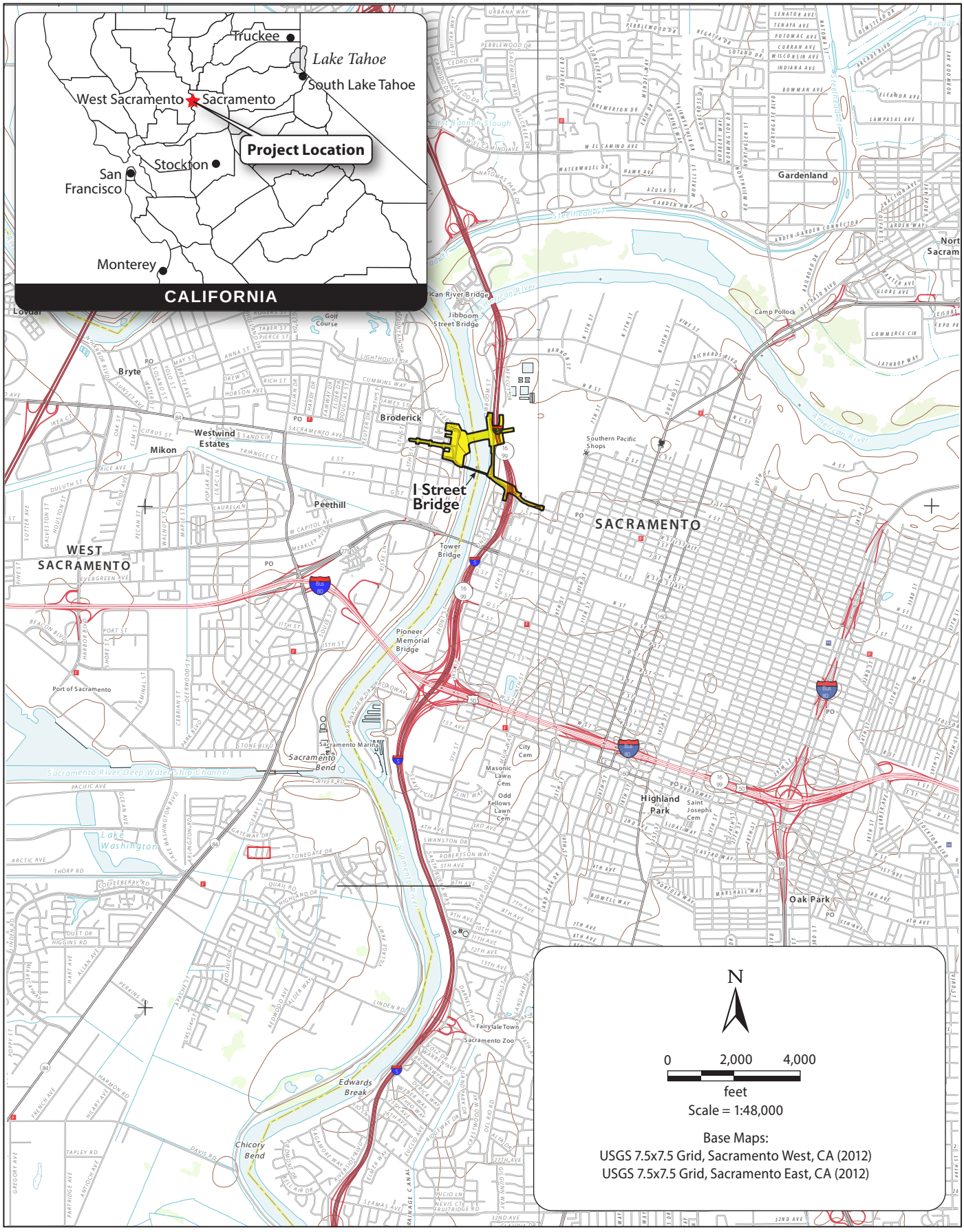

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Figure 1-1
Vicinity Map

  - A bridge that is consistent with the Need and Purpose statement [the adopted Sacramento River Crossings Alternatives Study statement] as articulated.
- In addition to the Neighborhood Friendly Bridge definition, the project should include pedestrian and bicycle facilities in the new public crossing that meet Americans with Disabilities Act (ADA) requirements, and facilitate connections to and from the new crossing and the Sacramento River Parkway and Riverfront Park trails.
- The proposed project also would need to construct a movable bridge that satisfies the vertical clearance and river navigation requirements of the U.S. Coast Guard (USCG).
- The project design should not preclude future addition of a streetcar, a separate, stand-alone project being developed by the Cities of West Sacramento and Sacramento.
- The new bridge also is intended to improve the connectivity to, and accessibility of, businesses, recreational areas, and new or redevelopment opportunity sites located in the urban core of Sacramento and West Sacramento.

1.1.1.2 Need

The project is needed for the following reasons.

- The existing I Street Bridge does not fully comply with current design and traffic operation standards due to the following conditions.
  - I Street Bridge limits or restricts traffic capacity and multimodal use. The current bridge width is not sufficient to provide adequate traffic operations, bicycle lanes, or the ability for transit service across the bridge.
  - The I Street Bridge and the four associated approach structures are on the federal eligible bridge list for federal funds for replacement and/or rehabilitation through the HBP. The I Street Bridge has been classified as functionally obsolete, and the existing approach structures have been classified as structurally deficient. The Cities of Sacramento and West Sacramento have decided to pursue replacement through the HBP.
- As adopted by the Sacramento City Council, new crossings of the Sacramento River between the City of Sacramento and City of West Sacramento shall be Neighborhood Friendly. In coordination with staff from the City of West Sacramento and SACOG, the definition for a Neighborhood Friendly Bridge was developed by the City of Sacramento and the Sacramento City Council adopted the definition by resolution in October 2011. The replacement bridge structure is required to be consistent with the Neighborhood Friendly Bridge definition.
- In addition to the Neighborhood Friendly Bridge requirements, lack of ADA compliance, non-standard and non-continuous sidewalks, and lack of bicycle facilities discourage walking and bicycling on the existing I Street Bridge.

- Section 9 of the Rivers and Harbors Act requires any local, state, or federal agency planning to construct a bridge over a navigable waterway to apply for a bridge permit through the USCG. The USCG requires the new bridge to meet or exceed the existing vertical clearance along the river, which is currently set by the US 50 Pioneer Bridge. In order to comply with the Neighborhood Friendly Bridge definition and meet the USCG requirements for navigation clearance, the new bridge will need to be movable.
- The SACOG MTP/SCS identifies that a proposed streetcar will cross over the new bridge from Sacramento to West Sacramento. While the streetcar will be a separate, stand-alone project, the bridge design must not preclude the future addition of a streetcar.
- Limited connectivity to the riverfront reduces the potential to achieve planned urban development and redevelopment of opportunity sites identified in the adopted plans of Sacramento and West Sacramento.

1.2 Project Description

This section describes the proposed action and the design alternatives that were developed to meet the identified need through accomplishing the defined purpose(s), while avoiding or minimizing environmental impacts. The alternatives under consideration are one bridge alignment for the new bridge over the Sacramento River and two alternatives for portions of the roadway design in Sacramento and in West Sacramento.

- City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection
  - Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive
  - Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive
- City of West Sacramento Residential Access
  - Alternative 1—C Street Connection to B Street
  - Alternative 2—C Street Connection to 3rd Street
- No-Build (No-Project) Alternative

The proposed project is located in Sacramento and Yolo Counties, over the Sacramento River and between the Cities of Sacramento and West Sacramento, and approximately 1,000 feet north of the existing I Street Bridge (Figure 1-1). The total length of the project is approximately 0.42 mile along C Street and Railyards Boulevard. The purpose of the project is to construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge from C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento in order to remove a series of functionally obsolete or structurally deficient bridges, consistent with the adopted findings of the Sacramento River Crossings Alternatives Study for Bridge Location 2 in the North Market Area.

1.2.1 Build Alternatives

One alignment is proposed for the new bridge over the Sacramento River. A new approximately 860-foot bridge, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides, is proposed. The bridge would include two fixed-span approach structures, approximately 200 feet and 270 feet in length, that tie into the Sacramento and West Sacramento banks of the river, respectively. The center span of the bridge would be an approximately 330-foot movable span that meets the USCG requirements. Roadway improvements on Railyards Boulevard in Sacramento and C Street in West Sacramento also are proposed. In both Sacramento and West Sacramento, two alternatives for portions of the roadway design are being considered. Figure 1-2 depicts the proposed project and the roadway design alternatives, described below.

- City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection
  - Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive
  - Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive

In the City of Sacramento, Alternative 1 consists of a signalized intersection at Jibboom Street and Bercut Drive, while Alternative 2 consists of a roundabout between these two intersections. Beyond the Jibboom Street and Bercut Drive intersections, the remaining project elements and limits in the City of Sacramento are similar under both alternatives.

- City of West Sacramento Residential Access
  - Alternative 1—C Street Connection to B Street
  - Alternative 2—C Street Connection to 3rd Street

In the City of West Sacramento, the proposed C Street alignment would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. Two alternatives are proposed for maintaining access to these parcels. Alternative 1 would construct a new connection to C Street, approximately 150 feet east of the C Street/3rd Street intersection, that would extend north to B Street and then ultimately connect to the 3rd Street/B Street intersection. Alternative 2 would connect to the same location at C Street as Alternative 1, approximately 150 feet east of the C Street/3rd Street intersection, but would continue north approximately 300 feet, then make a 90-degree left turn, and connect to 3rd Street approximately 300 feet north of C Street.

1.2.1.1 Common Design Features of the Build Alternatives

The proposed project would construct a new bridge over the Sacramento River between Sacramento and West Sacramento to replace the vehicular crossing that is provided by the existing I Street Bridge. The project would facilitate vehicular and multimodal traffic over the river in order to reduce traffic congestion, improve safety, and remove a number of structurally

deficient or functionally obsolete bridges that have reached the limit of their design life. While the existing I Street Bridge over the Sacramento River would remain in-place, the approach structures leading up to the bridge from both directions would be demolished. See Figure 1-2 for a depiction of the project limits and the approach structures that would be removed.

The Sacramento River is considered to be a navigable waterway of the United States. Under the provisions of the General Bridge Act of 1946, as amended, the USCG must approve proposed location and plans for bridges over navigable waters of the United States prior to commencing construction. In order to comply with the adopted Neighborhood Friendly Bridge definition and the USCG requirement to maintain navigation along the river, the new bridge is proposed to be a movable bridge.

Common design features of the build alternatives are listed below.

New Bridge Construction and Roadway Modifications

Bridge Construction

The proposed project would construct a new bridge over the Sacramento River. The total bridge length would be approximately 860 feet long, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides of the bridge. The bridge would include two fixed-span approach structures that tie into the Sacramento and West Sacramento banks of the river and are approximately 200 feet and 270 feet in length, respectively (see Figure 1-3). The center span of the bridge would be a movable span that meets the USCG requirements. The movable span is anticipated to be approximately 330 feet in length. The bridge soffit elevation would be set 3 feet above the 200-year water surface elevation to comply with the Central Valley Flood Protection Board (CVFPB) freeboard requirements.

The two fixed-span approach structures would be 72 feet wide, with a superstructure depth (or total bridge thickness) of approximately 6 feet. Each approach structure would be a two-span bridge. The abutment at one end of the structure would be constructed on the banks of the river, a center pier would be placed within the river approximately around the existing bank toe of slope, and the other end of the approach structure would be constructed on the piers for the movable span.

Based on coordination with the USCG, the movable span would provide a 278-foot clear channel opening approximately centered at the middle of the river. As such, the movable span has been identified as a vertical lift bridge, which would raise the bridge to a minimum vertical clearance of 59 feet over the maximum river elevation of 31 feet (measured to the NGVD 29 vertical datum). The truss depth of the movable span would be approximately 40 feet, with 6 feet of the structure being below the bridge deck and 34 feet above the bridge deck. The vertical towers

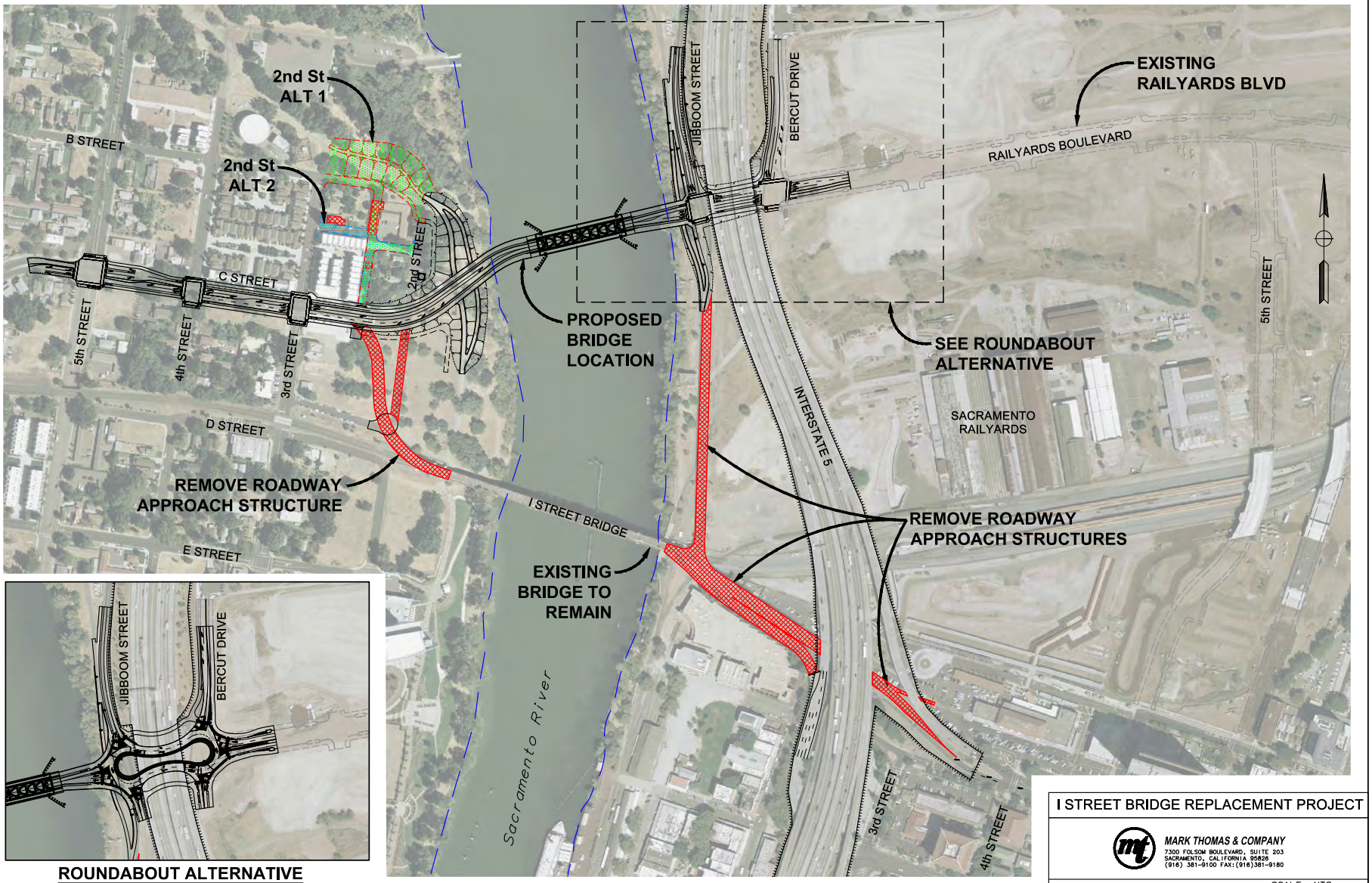

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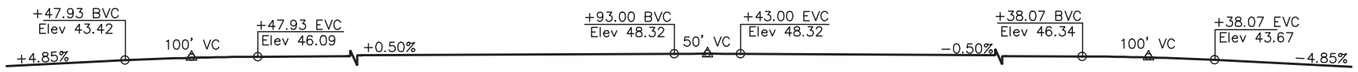
Figure 1-2
Proposed Project

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
03	YOL/SAC	"C"/"RY"	N/A

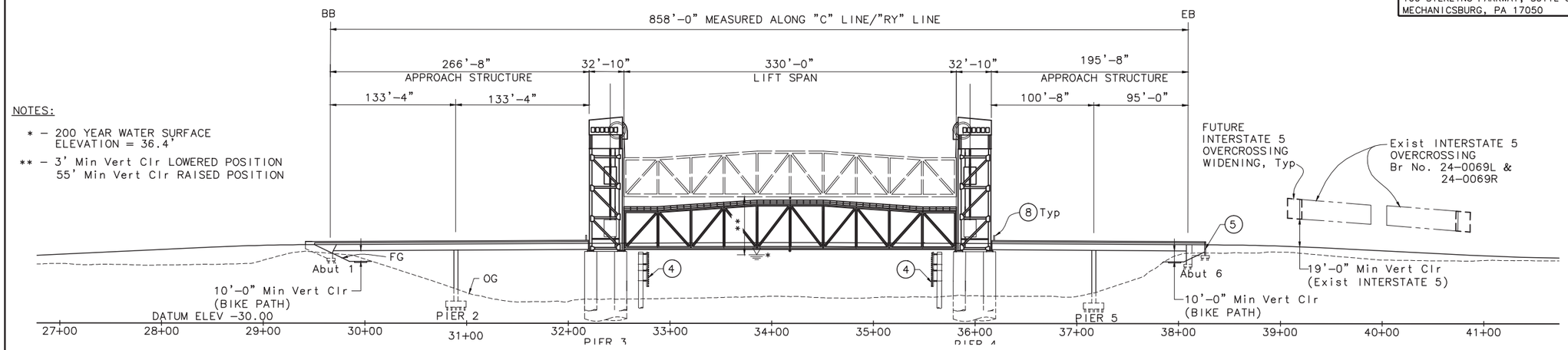
CITY OF SACRAMENTO
DEPARTMENT OF PUBLIC WORKS
915 I STREET, ROOM 2000
SACRAMENTO, CA 95814

MARK THOMAS & COMPANY, INC.
7300 FOLSOM BLVD., SUITE 203
SACRAMENTO, CA 95826

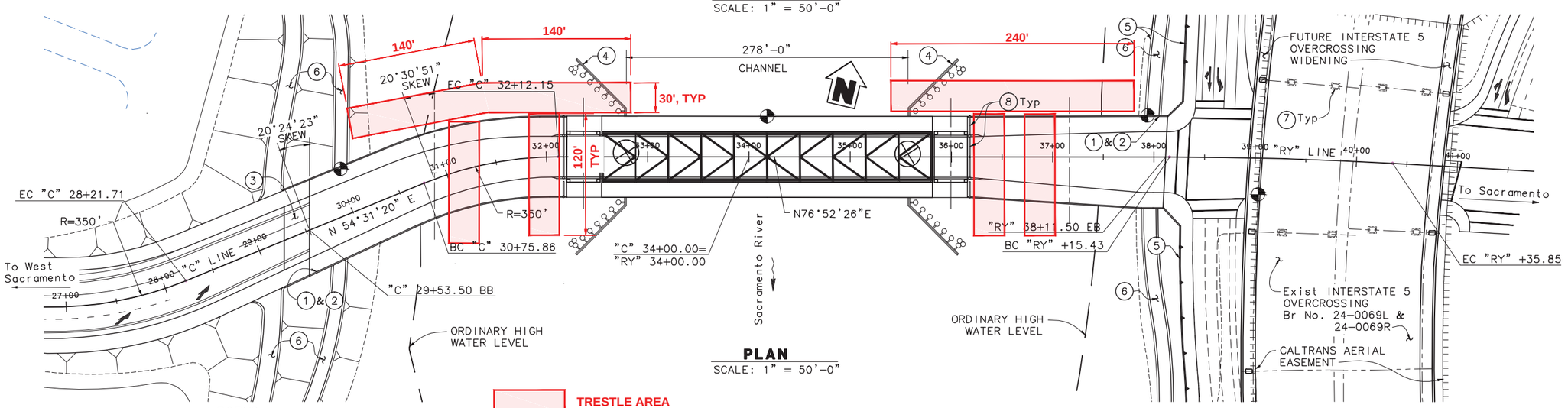
MODJESKI AND MASTERS, INC.
100 STERLING PARKWAY, SUITE 302
MECHANICSBURG, PA 17050



PROFILE GRADE
NO SCALE



ELEVATION
SCALE: 1" = 50'−0"



PLAN
SCALE: 1" = 50'−0"

TRESTLE AREA

LEGEND:

- POINT OF MINIMUM VERTICAL CLEARANCE
- USCG GPS TARGET LOCATION
- (1) PAINT BRIDGE NAME
- (2) PAINT BRIDGE NUMBER
- (3) APPROACH SLAB
- (4) FENDER SYSTEM
- (5) RETAINING WALL
- (6) BIKE PATH
- (7) ISOLATION CASING AROUND EXISTING BRIDGE COLUMNS
- (8) TRAFFIC/PEDESTRIAN GATE & WARNING SIGNAL

X
DESIGN OVERSIGHT
X
SIGN OFF DATE

DESIGNED BY	J. HICKEY	DATE	03−20−15
DRAWN BY	J. DOTY	DATE	03−20−15
CHECKED BY	T. PHAM	DATE	03−20−15
APPROVED	E. FREDRICKSON	DATE	03−20−15

E. FREDRICKSON
PROJECT ENGINEER

ALTERNATIVE 1
PLANNING STUDY
I STREET BRIDGE (REPLACE)

BRIDGE NO. XXX	UNIT:
SCALE: AS SHOWN	PROJECT NUMBER & PHASE: 03−XXXXXX

CONTRACT NO.: X PROJECT ID: 00000000000

ADVANCE PLANNING STUDY SHEET (ENGLISH) (REV. 7/16/10)
FILE => I STREET TRESTLE EXHIBIT.DWG
USERNAME => JDOTY DATE PLOTTED => 10-Jul-15 TIME PLOTTED => 10:41 AM
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Figure 1-3
Proposed I Street Bridge: Plan View, Profile, and Elevation

would be approximately 130 feet tall, measured from the bridge soffit elevation. The vertical towers would be approximately 33 feet in thickness and the same width as the bridge deck. The total bridge width on the movable span would be 81 feet.

Due to the existing soil conditions, the bridge would be constructed on deep pile foundations. The abutments for the fixed-span approach structures at the river bank would consist of approximately 50 piles per abutment that are driven or cast-in-drill-hole (CIDH), to a depth of approximately 70 feet below the original ground elevation. The center piers for the two fixed-span approach structures (located approximately at the bank toe of slope in the river, below the ordinary high water mark) would consist of 50 driven or CIDH piles per pier that are approximately 70 feet below the original ground elevation. If driven piles are selected for either the abutments or piers, the piles would be precast concrete or steel. The foundations for the movable span would consist of four large-diameter cast-in-steel-shell piles per pier. Each pile would be 9 feet in diameter, extending approximately 140 feet below the original ground elevation.

Erosion control measures would be installed around the proposed bridge foundations to prevent future scour at the bridge supports. It is anticipated that rock slope protection (RSP) would be installed around the bridge abutments and piers within the water to control erosion.

A bridge fender system also is planned around the movable span piers to protect the piers from errant watercrafts that are navigating along the river. The fender system would include approximately 30 driven concrete or wooden piles around each of the movable span piers. The piles would be driven to a depth of approximately 30 feet below the original ground elevation.

Temporary Falsework

Temporary falsework platforms (trestles) would be required to construct the proposed bridge foundations and approach structures. The platforms would be constructed during the first construction season using temporary piles within the river. Each temporary platform would include approximately 80 driven steel piles; the piles would be either 16-inch diameter or 16-inch H piles. Once installed, the temporary trestle piles would remain in the river throughout the duration of construction and would be removed in the second construction season following completion of construction. In addition, temporary cofferdams would be required to construct the bridge piers within the water. The cofferdams would consist of temporary sheet piles installed around the individual piers. The sheet piles would be installed and removed with a vibratory hammer. Dewatering inside the cofferdams would be required.

Bridge Construction Sequence

Figure 1-4 shows the sequencing of construction activities. All in-water work would be conducted between May 1 and November 30 during the two construction seasons. This schedule is intended to reduce the number of construction seasons to construct the bridge.

Roadway Modifications

City of Sacramento

In Sacramento, Bercut Drive would be modified from Railyards Boulevard north approximately 500 feet. Bercut Drive would be designed to have two northbound lanes at the Railyards Boulevard intersection, tapering down to one northbound lane at the northern project limits, and one southbound lane. Improvements to Bercut Drive south of Railyards Boulevard are not part of, nor needed for, the proposed project and would be constructed if needed as part of a separate future project.

Proposed improvements on Jibboom Street would extend 550 feet north of Railyards Boulevard. The roadway would consist of one travel lane in each direction, on-street Class II bike lanes, sidewalk along the west side of the roadway, and retaining walls of various heights along both sides of the road. Extension of Jibboom Street south of Railyards Boulevard is not included with, nor needed for, the proposed project and would be constructed if needed as part of a separate future project.

The proposed roadway profile for Railyards Boulevard would be approximately 6 feet higher than the original ground elevation at the Jibboom Street intersection. The profile adjustment is needed in order to satisfy the CVFPB requirements to provide 3 feet of clearance between the 200-year-flood water surface elevation and the bridge soffit (or low chord of the bridge).

City of West Sacramento

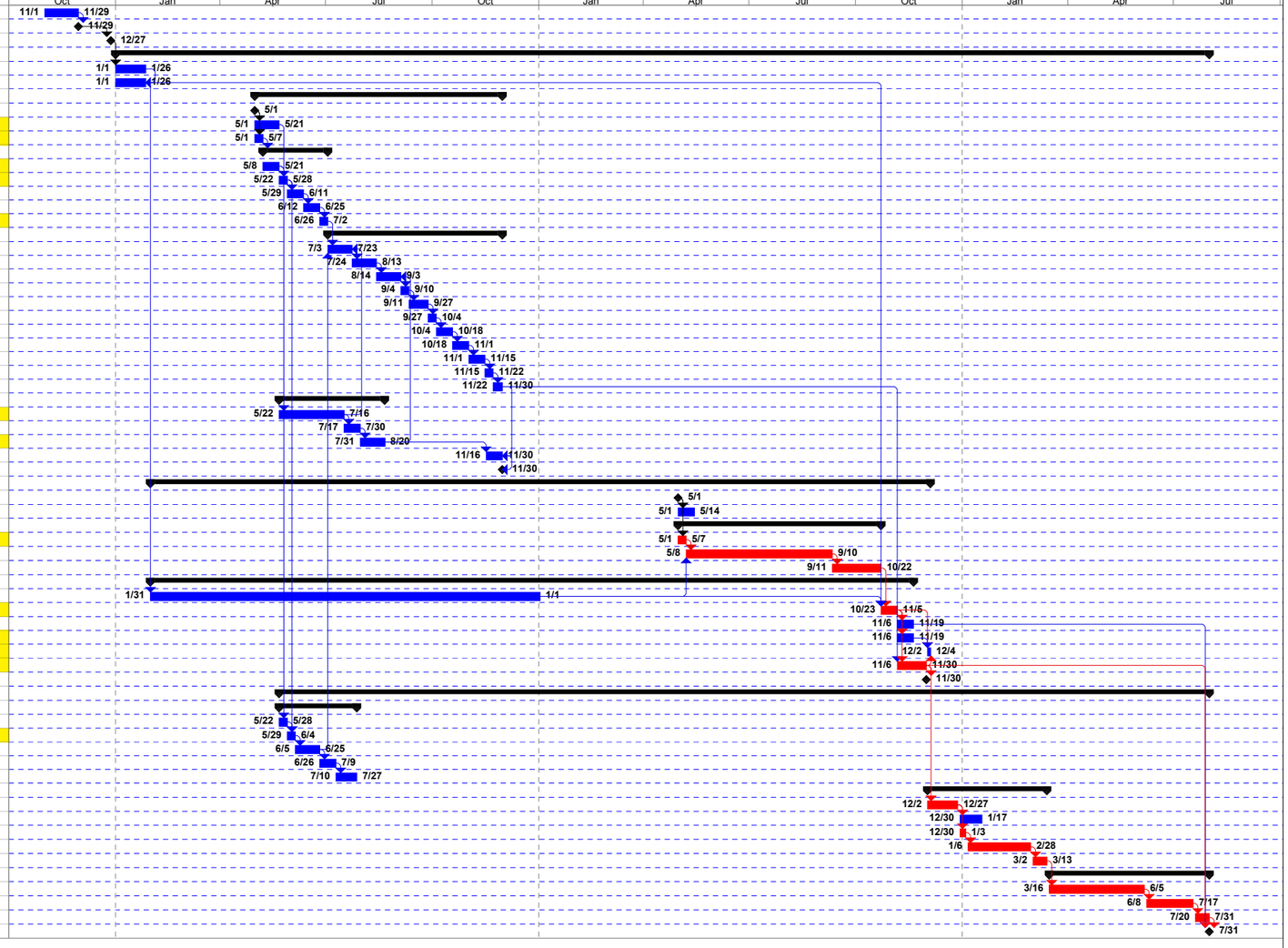
Between the bridge touchdown location along C Street in West Sacramento and the 4th Street/ C Street intersection, the roadway would consist of one westbound travel lane, two eastbound travel lanes (the two eastbound travel lanes would taper down to one eastbound lane east of the 3rd Street intersection), a center left-turn lane, on-street Class II bike lanes, on-street parking along the north side of the roadway, and sidewalks along both sides of the roadway. As the roadway through this section currently consists of the proposed number of travel lanes, the widening through this area is primarily needed to support the Class II bike lanes and wider sidewalks.

Along C Street between 4th Street and 5th Street, the roadway would consist of one travel lane in each direction, left-turn lanes, on-street Class II bike lanes, and sidewalks along both sides of the

I Street Bridge Replacement Construction Schedule

7-Day Work Week

ID	Task Name	Duration	Start	Finish	Predecessors	Successors
1	Advertise	21 days	Wed 11/1/17	Wed 11/29/17		2
2	**Bid Opening**	**0 days**	**Wed 11/29/17**	**Wed 11/29/17**	**1**	**3FS+4 wks**
3	**Award**	**0 days**	**Wed 12/27/17**	**Wed 12/27/17**	**2FS+4 wks**	**5**
4	**Working Days**	**675 days**	**Mon 1/1/18**	**Fri 7/31/20**		
5	Submittals/Shop Drawings	4 wks	Mon 1/1/18	Fri 1/26/18	3	6FF
6	Mobilize	4 wks	Mon 1/1/18	Fri 1/26/18	5FF	43,44
7	**In Water Work Season 1**	**153.5 days**	**Tue 5/1/18**	**Fri 11/30/18**		
8	**In Water Work Begins**	**0 days**	**Tue 5/1/18**	**Tue 5/1/18**		**9,10**
9	Install Temp Constr Trestle From Bank to Piers	3 wks	Tue 5/1/18	Mon 5/21/18	8	30
10	Setup Barge	1 wk	Tue 5/1/18	Mon 5/7/18	8	11
11	**Pier 2&5 Work**	**40 days**	**Tue 5/8/18**	**Mon 7/2/18**	**10**	
12	Cofferdam and Dewatering	2 wks	Tue 5/8/18	Mon 5/21/18		13,52
13	Pier 2&5 Pile Driving	1 wk	Tue 5/22/18	Mon 5/28/18	12	14,53
14	Form/Pour Pier 2&5 Pile Cap	2 wks	Tue 5/29/18	Mon 6/11/18	13	15
15	Pier 2 & 5 Column Construction	2 wks	Tue 6/12/18	Mon 6/25/18	14	16
16	Remove Cofferdam & Place Rock Slope Protection	1 wk	Tue 6/26/18	Mon 7/2/18	15	18
17	**Approach Superstructure**	**108.5 days**	**Tue 7/3/18**	**Fri 11/30/18**		
18	Erect Falsework & Soffit	3 wks	Tue 7/3/18	Mon 7/23/18	30FF,54,16	19
19	Form Exteriors, Overhangs	3 wks	Tue 7/24/18	Mon 8/13/18	18	20
20	Rebar and Soffit Stems	3 wks	Tue 8/14/18	Mon 9/3/18	19,32FF	21
21	Install PT Ducts	1 wk	Tue 9/4/18	Mon 9/10/18	20	22
22	Form, Pour Soffit & Stems	2.5 wks	Tue 9/11/18	Thu 9/27/18	21	23
23	Strip Stems & Lost Deck	1 wk	Thu 9/27/18	Thu 10/4/18	22	24
24	Place Lost Deck	2 wks	Thu 10/4/18	Thu 10/18/18	23	25
25	Deck Rebar & Pour	2 wks	Thu 10/18/18	Thu 11/1/18	24	26
26	Deck Cure	2 wks	Thu 11/1/18	Thu 11/15/18	25	27
27	Stress & Grout Bridge	1 wk	Thu 11/15/18	Thu 11/22/18	26	28
28	Remove Falsework	6 days	Thu 11/22/18	Fri 11/30/18	27	48,33FF
29	**Pier 3&4 Work**	**65 days**	**Tue 5/22/18**	**Mon 8/20/18**		
30	Vibrate/Drive 108-in Casings	8 wks	Tue 5/22/18	Mon 7/16/18	9	31,18FF
31	Set Cage & Cast 108-in Piles	2 wks	Tue 7/17/18	Mon 7/30/18	30	32
32	Form/Pour Cap for Shafts & Place Rock Slope Protect	3 wks	Tue 7/31/18	Mon 8/20/18	31	20FF,33
33	Remove Portion of Trestle (Leave Piles in Place)	2 wks	Fri 11/16/18	Fri 11/30/18	32,28FF	34FF
34	**In Water Work Ends Season 1**	**0 days**	**Fri 11/30/18**	**Fri 11/30/18**	**33FF**	
35	**In Water Work Season 2**	**480.5 days**	**Wed 1/31/18**	**Wed 12/4/19**		
36	**In Water Work Begins**	**0 days**	**Wed 5/1/19**	**Wed 5/1/19**		**37,39**
37	Install Temp Constr Trestle (except piling)	2 wks	Wed 5/1/19	Tue 5/14/19	36	
38	**Pier 3&4 Work**	**125 days**	**Wed 5/1/19**	**Tue 10/22/19**		
39	**Setup Barge**	**1 wk**	**Wed 5/1/19**	**Tue 5/7/19**	**36**	**40**
40	**Erect Vertical Lift Towers**	**18 wks**	**Wed 5/8/19**	**Tue 9/10/19**	**39,43**	**41**
41	**Install and Test Bridge Operating Equipment**	**6 wks**	**Wed 9/11/19**	**Tue 10/22/19**	**40**	**44**
42	**Lift Span**	**470 days**	**Wed 1/31/18**	**Tue 11/19/19**		
43	Construct Vertical Lift Span (Offsite)	8.57 mons	Wed 1/31/18	Tue 1/1/19	6	40,44
44	**Float in Lift Span & Erect**	**2 wks**	**Wed 10/23/19**	**Tue 11/5/19**	**6,41,43**	**45,47,48,46**
45	Make Lift Span Operational	2 wks	Wed 11/6/19	Tue 11/19/19	44	67
46	Install Fender System & Piles	2 wks	Wed 11/6/19	Tue 11/19/19	44	47
47	Remove Barge	0.5 wks	Mon 12/2/19	Wed 12/4/19	44,46,48	
48	**Remove Trestle & Piles**	**18 days**	**Wed 11/6/19**	**Sat 11/30/19**	**28,44**	**67,58,49,47**
49	**In Water Work Ends Season 2**	**0 days**	**Sat 11/30/19**	**Sat 11/30/19**	**48**	
50	**Out of Water Work**	**574 days**	**Tue 5/22/18**	**Fri 7/31/20**		
51	**Construct Abut 1/6**	**49 days**	**Tue 5/22/18**	**Fri 7/27/18**		
52	Excavate Abutment	1 wk	Tue 5/22/18	Mon 5/28/18	12	53
53	Drive Abut Piles	1 wk	Tue 5/29/18	Mon 6/4/18	52,13	54
54	Pour Abut	3 wks	Tue 6/5/18	Mon 6/25/18	53	55,18
55	Backfill Abutment	10 days	Tue 6/26/18	Mon 7/9/18	54	56
56	Approach Slabs	14 days	Tue 7/10/18	Fri 7/27/18	55	
57	**Approach Superstructure**	**75 days**	**Mon 12/2/19**	**Fri 3/13/20**		
58	**Barriers, Median**	**4 wks**	**Mon 12/2/19**	**Fri 12/27/19**	**48**	**59,60**
59	Lighting	3 wks	Mon 12/30/19	Fri 1/17/20	58	
60	**Joint Seals**	**1 wk**	**Mon 12/30/19**	**Fri 1/3/20**	**58**	**61**
61	**Finalize Roadway Conforms**	**8 wks**	**Mon 1/6/20**	**Fri 2/28/20**	**60**	**62**
62	**Punch List**	**2 wks**	**Mon 3/2/20**	**Fri 3/13/20**	**61**	**64**
63	**Demo Existing Approach Structures**	**100 days**	**Mon 3/16/20**	**Fri 7/31/20**		
64	**Demo Existing Approach Structures**	**12 wks**	**Mon 3/16/20**	**Fri 6/5/20**	**62**	**65**
65	**Cleanup**	**6 wks**	**Mon 6/8/20**	**Fri 7/17/20**	**64**	**66**
66	**Punch List**	**2 wks**	**Mon 7/20/20**	**Fri 7/31/20**	**65**	**67**
67	**Project Completion**	**0 days**	**Fri 7/31/20**	**Fri 7/31/20**	**48,45,66**	



Project: I Street Bridge Replacement Construction Schedul
Date: Wed 2/10/16

Task	Rolled Up Task	Split	Inactive Task	Duration-only	Finish-only		
Critical Task	Rolled Up Critical Task	External Tasks	Inactive Milestone	Manual Summary Rollup	Progress		
Milestone	Rolled Up Milestone	Project Summary	Inactive Summary	Manual Summary	Deadline		
Summary	Rolled Up Progress	Group By Summary	Manual Task	Start-only	Construction Activities with In-Water Effects		

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Figure 1-4
Construction Schedule

road. All of the improvements through this section would be accommodated within the existing roadway limits.

Class I Bikeway and Levee Modifications and Improvements

City of Sacramento

The existing Class I Sacramento River Parkway along Jibboom Street would be reconstructed approximately 500 feet north and 300 feet south of Railyards Boulevard as part of the proposed project. In order to maintain a continuous off-street Class I path along this section, the path would be grade-separated under the proposed bridge structure. Cyclists and pedestrians approaching Railyards Boulevard in either direction would have the option to continue along the path under the new structure, avoiding the need to cross the roadway. Cyclists and pedestrians who are traveling along the path also would have the option to connect to Railyards Boulevard and cross over the proposed bridge into West Sacramento or turn east into Sacramento. Due to the limited horizontal clearance between the river and the Interstate 5 (I-5) viaduct structure, retaining walls would be needed along the path to account for the vertical elevation difference between Jibboom Street and the path that continues under the proposed bridge structure. The maximum retaining wall height along the bike path would be 16 feet.

City of West Sacramento

The proposed project would require improvements to the existing levee along the West Sacramento side of the river, where the proposed bridge alignment would connect to C Street. The existing levee does not meet current standards required by Title 23 of the California Code of Regulations (CCR). Extending approximately 300 feet north and south of the proposed C Street alignment, the levee cross-section would be reconstructed to meet current design standards, which would require 3:1 side slopes on the landside and waterside of the levee, and a 20-foot-wide crown at the top of the levee. The levee improvements also would include a slurry cutoff wall extending to a depth of 110 feet below the original ground elevation. In addition, the proposed roadway profile would be approximately 6 feet higher than the original ground elevation as it crosses over the levee. In order to maintain access to the levee for inspection and maintenance services, access roads would be constructed from the new roadway to the top of the improved levee section. The proposed grading for the levee would require relocation of the existing water tower that is located along 2nd Street, just north of the proposed C Street alignment. The tower would be relocated to the northwest, approximately 43 feet from its existing location.

The new levee maintenance road also would serve as the future Class I River Walk Park trail extension in West Sacramento. Similar to the trail improvements proposed as part of the project in Sacramento, the trail would be grade-separated under the proposed bridge structure. Cyclists

and pedestrians approaching C Street in either direction would have the option to continue along the trail under the new structure, avoiding the need to cross the roadway. Cyclists and pedestrians who are traveling along the trail also would have the option to connect to C Street to cross over the proposed bridge into Sacramento or head west on C Street.

Storm Water Drainage Management

Drainage for the proposed roadway would be conveyed to the existing storm drain system installed within Railyards Boulevard and C Street. Railyards Boulevard currently drains storm water to the east along the roadway and then into a retention basin south of Railyards Boulevard. C Street drains storm water west along the roadway and then ultimately south beyond the project limits.

As is standard with all construction projects, the contractor would be required to install temporary best management practices (BMPs) to control any runoff or erosion from the project site into the surrounding waterways. These temporary BMPs would be installed prior to any construction operations and would be in place for the duration of the contract. The removal of these BMPs would be the final operation, along with project site cleanup.

Structure Demolition and Roadway Modifications

Following completion of the new bridge connections at Railyards Boulevard and C Street, traffic would be diverted to the new bridge, and the four existing approach structures to the I Street Bridge would be removed. Bridge numbers 24C0364L, 24C0364R, 22-0033, and 22C0154 would be demolished and the foundations would be removed to a depth of 3 feet below the original ground elevation. Encroachment permits from Caltrans and Union Pacific Railroad would be needed to complete the bridge removal. The existing I Street Bridge is owned and operated by Union Pacific Railroad and would continue to remain in-place and used by trains following construction of the new bridge.

As part of the removal of the existing approach structures, the project would include modifications to I Street within the City of Sacramento from the southbound I-5 on-ramp east to the 5th Street intersection. The modification would include signing and striping revisions, demolition of existing roadway sections that are no longer required, and removal of bridge abutments and foundations.

Staging, Storage, and Proposed Access during Construction

Two staging areas would be used to store materials and equipment during construction, such as pipe materials, precast manholes and drop inlets, steel girders, piles, and rebar, along with the construction equipment when not in use. One area would be located south of Railyards Boulevard under I-5 in Sacramento; the other area would be located west of the landward side of

the levee, south of the new bridge location in West Sacramento. The staging area located along Railyards Boulevard would be accessed via the existing intersection at Jibboom Street. The staging area in West Sacramento would be accessed via the existing 2nd Street connection at 3rd Street, south of C Street. The staging areas would be in use throughout the construction duration; the areas would be returned to their pre-project conditions at the completion of the project.

Utility Relocations

A number of public and private utilities would need to be relocated or adjusted to grade as part of the project, including existing water, sewer, gas, electric, and communication facilities within Jibboom Street, Bercut Drive, C Street, and 2nd Street.

Traffic Management and Detours during Construction

While most of the project would be constructed outside of existing roadways, some areas would require temporary detours or staged construction.

Along Jibboom Street at the proposed Railyards Boulevard intersection, the new roadway profile would be raised approximately 6 feet above the original ground elevation. To maintain access to the existing Jibboom Street viaduct south of Railyards Boulevard during the roadway construction, a temporary access road would be needed. The proposed temporary access road would connect to the existing Jibboom Street viaduct abutment approximately 350 feet south of Railyards Boulevard. The temporary road would then continue under I-5 and connect to the Railyards Boulevard/Bercut Drive intersection. The temporary road would require placement of temporary fill material and a roadway structural section that would be removed after construction of the new bridge. Traffic traveling north along Jibboom Street would continue north along Bercut Drive to access the Richards Boulevard/I-5 interchange.

In order to complete the improvements at Jibboom Street and Railyards Boulevard, Jibboom Street would be closed to traffic approximately 600 feet north of Railyards Boulevard. Traffic traveling south along Jibboom Street to continue over the existing I Street Bridge into West Sacramento would be detoured over to Bercut Drive at Richards Boulevard. Traffic would then use the temporary access road to connect to the Jibboom Street viaduct structure. The temporary access road would be in place for approximately 2 years, after which traffic would use the new roadways and new bridge.

The Sacramento River Parkway trail along Jibboom Street also would require temporary re-routing during construction. The temporary alignment for the trail would follow the temporary Jibboom Street alignment south of Railyards Boulevard. Cyclists and pedestrians would then continue following a detour north along Bercut Drive to Richards Boulevard, where they could

then connect back to the Parkway on the west side of I-5. The detour would be in place for approximately 2 years.

During construction, traffic along C Street would be maintained along the existing approach structure until the new bridge is constructed.

Project Construction Sequence

New bridge and roadway construction would occur first, followed by demolition of the four approach structures that connect to the existing I Street Bridge. Once the new bridge and roadways are constructed, traffic would be diverted to the new bridge in order to allow demolition adjacent to the existing bridge. Construction of the project is expected to take approximately 30 months.

Property Acquisition

The project would require temporary and permanent property acquisitions along C Street, 3rd Street, and 2nd Street within the City of West Sacramento and along Railyards Boulevard, Jibboom Street, Bercut Drive, and I Street within the City of Sacramento.

Along C Street, temporary and permanent acquisitions would be required along the south side of the roadway to accommodate the construction of standard shoulders, bike lanes, and sidewalks—from the intersection of 4th Street to the Sacramento River.

Along 3rd Street and 2nd Street, temporary and permanent acquisitions would be needed from the Union Pacific Railroad on the south, to just north of the B Street intersections, for construction of the proposed roadway and levee improvements.

Along Railyards Boulevard, Jibboom Street, and Bercut Drive, temporary and permanent acquisition would be needed from the current state-owned right-of-way for I-5, for construction of the roadway. In addition, temporary and permanent acquisitions would be needed along Jibboom Street for the proposed temporary detour road and Class I bikeway improvements.

Temporary acquisition would be required along the existing I Street connection to facilitate removal of the existing viaduct structures. Due to the limited space available in Old Sacramento, it is anticipated that construction activities would occur from the parking lot at the intermodal station.

1.2.1.2 Unique Features of Build Alternatives

In both the City of Sacramento and the City of West Sacramento, two alternatives for portions of the roadway design are being considered.

City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection

Alternative 1 consists of a signalized intersection at Jibboom Street and Bercut Drive, while Alternative 2 consists of a roundabout between these two intersections. Beyond the Jibboom Street and Bercut Drive intersections, the remaining project elements and limits are similar under both alternatives.

Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive

Under Alternative 1, Railyards Boulevard would be extended west over the Sacramento River; east of Bercut Drive. Railyards Boulevard would consist of two westbound lanes and one eastbound lane. Between Jibboom Street and Bercut Drive, Railyards Boulevard would consist of two westbound lanes and three eastbound lanes; two eastbound lanes would be trapped into left-turn lanes onto Bercut Drive, and one eastbound lane would continue along Railyards Boulevard. West of the Jibboom Street intersection, Railyards Boulevard would consist of one lane in each direction.

Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive

Under Alternative 2, Railyards Boulevard would be extended west over the Sacramento River. East of Bercut Drive, Railyards Boulevard would consist of two westbound lanes and one eastbound lane. Between Jibboom Street and Bercut Drive, Railyards Boulevard would consist of a roundabout with two lanes in each direction. One westbound lane would be a trap onto northbound Jibboom Street, and one westbound lane would continue onto the new bridge. One eastbound lane would be trapped into left-turn lanes onto Bercut Drive, and one eastbound lane would continue along Railyards Boulevard. West of Jibboom Street, Railyards Boulevard would consist of one lane in each direction.

City of West Sacramento Residential Access

The new C Street alignment would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. Two alternatives are proposed for maintaining access to these parcels.

Alternative 1—C Street Connection to B Street

Alternative 1 would construct a new connection to C Street approximately 150 feet east of the 3rd Street intersection. The new access road would be 30 feet wide, extend north to B Street, and then ultimately connect to the 3rd Street/B Street intersection. This alternative would require right-of-way acquisitions from six individual parcels and removal of two structures. One structure is located on APN 010-101-010 and appears to be an individual residence. Another structure is located on APN 010-101-013 and appears to be an apartment building that supports up to four individual apartments. As B Street currently is constructed along the existing levee, the roadway improvements also would require an additional 500 feet of improvements to the levee. Similar to the improvements identified along C Street, the levee cross-section would be

reconstructed to meet current design standards, which require 3:1 side slopes on the landside and waterside of the levee, with a 20-foot-wide crown at the top of the levee. The levee improvements also would include a slurry cutoff wall that extends to a depth of 110 feet below the original ground elevation.

Alternative 2—C Street Connection to 3rd Street

Alternative 2 would connect to the same location at C Street, approximately 150 feet east of the 3rd Street intersection and continue north approximately 300 feet. This alternative would then make a 90-degree left turn and connect to 3rd Street approximately 300 feet north of C Street. This alternative would require right-of-way acquisition from seven individual parcels and removal of three structures. One structure is located on APN 010-101-010 and appears to be an individual residence. Another structure is located on APN 010-101-013 and appears to be an apartment building that supports up to one individual apartment. The last structure is located on APN 010-101-004 and appears to be an individual residence.

1.2.2 No Build (No Project) Alternative

Under the No Build Alternative, the existing I Street Bridge would remain in use for vehicle, bicycle, and pedestrian access between the Cities of Sacramento and West Sacramento. No changes to traffic patterns on I Street or C Street would occur. The four approach structures would remain in place and in use; and there would be no changes to existing roadways, levees or Class I bikeways.

Improvements and development of transportation infrastructure would continue following the General Plans of both cities, the Sacramento Railyards Specific Plan (approved December 2007), and the Washington Specific Plan (adopted May 1996). The Sacramento Railyards Specific Plan identifies the extension of Railyards Boulevard west to a Tee intersection at Jibboom Street. Railyards Boulevard at Bercut Drive would consist of two westbound lanes and one eastbound lane. The same number of lanes on Railyards Boulevard would extend west to the intersection with Jibboom Street; at this point, the left westbound lane on Railyards Boulevard would become a dedicated left-turn onto southbound Jibboom Street, and the right westbound lane would be a dedicated right-turn onto northbound Jibboom Street.

In West Sacramento, future changes to C Street would be based on the Washington Specific Plan, which identifies 12-foot-wide sidewalks and 7-foot-wide Class II bike lanes along the roadway. The connection to the I Street Bridge would not change.

Chapter 2 Study Methods

This chapter describes the regulatory requirements that are relevant to biological resources and the methods used to identify special-status species and their habitats, sensitive natural communities, and waters of the United States and State (including wetlands) in the biological study area (BSA). The BSA includes all areas of proposed permanent and temporary impacts, as well as the area under I-5 and adjacent to the proposed removal of roadway approach structures in the City of Sacramento and parcels adjacent to some of the proposed road improvements in the City of West Sacramento.

2.1 Regulatory Requirements

This section summarizes the federal and state regulations that protect special-status species; waters of the United States (which also are considered waters of the State), including wetlands; and sensitive habitats. This section also discusses pertinent local general plan policies and ordinances related to the protection and preservation of biological resources.

2.1.1 Federal Regulations

2.1.1.1 Federal Endangered Species Act

The federal Endangered Species Act (ESA) of 1973, and subsequent amendments, provides regulations for the conservation of endangered and threatened species and the ecosystems on which they depend. The U.S. Fish and Wildlife Service (USFWS) (with jurisdiction over plants, wildlife, and resident fish) and the National Marine Fisheries Service (NMFS) (with jurisdiction over anadromous fish and marine fish and mammals) oversee the ESA. Section 7 of the ESA mandates all federal agencies to consult with USFWS and NMFS if they determine that a proposed project may affect a listed species or destroy or adversely modify designated critical habitat. Section 7 requirements do not apply to nonfederal actions. A Clean Water Act (CWA) Section 404 permit from the U.S. Army Corps of Engineers (USACE) will be required for project construction. Consequently, consultation under Section 7 for effects to federally listed species will be required. Under Section 7, the federal lead agency must obtain incidental take authorization or a letter of concurrence stating that the proposed project is not likely to adversely affect federally listed species.

Section 9 of the ESA prohibits the take of any fish or wildlife species listed as endangered, including the destruction of habitat that prevents the species' recovery. *Take* is defined as any action or attempt to hunt, harm, harass, pursue, shoot, wound, capture, kill, trap, or collect a species. Section 9 prohibitions also apply to threatened species unless a special rule has been defined with regard to take at the time of listing. Under Section 9 of the ESA, the take

prohibition applies only to wildlife and fish species. However, Section 9 does prohibit the unlawful removal and possession, or malicious damage or destruction, of any endangered plant from federal land. Section 9 prohibits acts to remove, cut, dig up, damage, or destroy an endangered plant species in nonfederal areas in knowing violation of any state law or in the course of criminal trespass. Candidate species and species that are proposed for or under petition for listing receive no protection under Section 9.

Federally listed species identified as having the potential to occur in the BSA for the proposed project include valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run Chinook salmon (*O. tshawytscha*), Central Valley steelhead (*O. mykiss*), North American green sturgeon (*Acipenser medirostris*), and delta smelt (*Hypomesus transpacificus*). In addition, designated critical habitat for Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, North American green sturgeon, and delta smelt occurs in the BSA. These species and designated critical habitat are discussed in Chapter 4.

2.1.1.2 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Management and Conservation Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires federal agencies to consult with NMFS on activities that may adversely affect essential fish habitat (EFH). The purpose of the MSA is to conserve and manage the fishery resources of the United States and to promote protection of EFH. *EFH* is the aquatic habitat necessary for fish to spawn, breed, feed, or grow to maturity that will allow a level of production needed to support a long-term, sustainable commercial fishery and contribute to a healthy ecosystem (Pacific Fishery Management Council 2003). Important components of EFH include substrate, water quality, water quantity, depth, velocity, channel gradient and stability, food, cover, habitat complexity, space, access and passage, and habitat connectivity. EFH is described for Pacific salmon fisheries (specifically Chinook salmon) in Chapter 4. The MSA requires the following.

- Federal agencies undertaking, permitting, or funding an activity that may adversely affect EFH are required to consult with NMFS.
- NMFS is required to provide conservation recommendations for any federal or state activity that may adversely affect EFH.
- Within 30 days of receiving conservation recommendations from NMFS, federal agencies must provide a detailed response in writing to NMFS regarding the conservation recommendations (the response must include a description of measures proposed by the

agency for avoiding, mitigating, or offsetting the impact of the activity on EFH, or reasons for not following the recommendations).

An EFH assessment will be prepared for NMFS jointly with a Biological Assessment (BA) to address potential effects on Pacific salmon fisheries (specifically, Chinook salmon).

2.1.1.3 Executive Order 11990: Protection of Wetlands

Executive Order (EO) 11990, signed May 24, 1977, directs all federal agencies to refrain from assisting in or giving financial support to projects that encroach on publicly or privately owned wetlands. It further requires that federal agencies support a policy to minimize the destruction, loss, or degradation of wetlands. A project that encroaches on wetlands may not be undertaken unless the agency has determined that (1) there are no practicable alternatives to such construction; (2) the project includes all practicable measures to minimize harm to wetlands that would be affected by the project; and (3) the impact will be minor.

The proposed project would affect wetlands; therefore, federal agencies are required to consider this EO prior to issuing permits. Potential project effects to wetlands are discussed in Chapter 4.

2.1.1.4 Executive Order 12962: Recreational Fisheries

EO 12962, signed June 7, 1995, and amended by EO 13474 on September 26, 2008, directs all federal agencies to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities—to the extent permitted by law and where practicable. This EO requires evaluation and documentation in NEPA analyses of the effects caused by federally funded, permitted, or authorized actions on aquatic systems, fishing access, and recreational fisheries.

The proposed project may reduce the abundance of fish in the BSA; therefore, federal agencies are required to consider this EO prior to issuing permits. Measures identified in Chapter 4 will avoid, minimize, or compensate for project effects to fish and fish habitat.

2.1.1.5 Executive Order 13112: Prevention and Control of Invasive Species

EO 13112, signed February 3, 1999, directs all federal agencies to prevent and control the introduction of invasive species in a cost-effective and environmentally sound manner. The EO established the National Invasive Species Council (NISC), which is composed of federal agencies and departments, and a supporting Invasive Species Advisory Committee (ISAC) composed of state, local, and private entities. In 2008, NISC released an updated national invasive species management plan (National Invasive Species Council 2008) that recommends objectives and measures to implement the EO and to prevent the introduction and spread of invasive species. The EO requires consideration of invasive species in NEPA analyses, including

their identification and distribution, their potential impacts, and measures to prevent or eradicate them.

The proposed project may introduce or spread invasive species into the BSA; therefore, federal agencies are required to consider this EO prior to issuing permits. Measures identified in Chapter 4 will avoid or minimize the introduction and spread of invasive species as a result of project activities.

2.1.1.6 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) protects migratory bird species from take. Under the MBTA, *take* is defined as to (or attempt to) pursue, hunt, shoot, capture, collect, or kill (50 Code of Federal Regulations [CFR] 10.12). The definition differentiates between intentional take (take that is the purpose of the activity in question) and unintentional take (take that results from, but is not the purpose of, the activity in question). EO 13186, signed January 10, 2001, directs each federal agency taking actions that would, or likely would, negatively affect migratory bird populations to work with USFWS to develop a memorandum of understanding (MOU) to promote the conservation of migratory bird populations. Protocols developed under the MOU must include the following agency responsibilities.

- Avoid and minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.
- Restore and enhance habitat of migratory birds, as practicable.
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

The EO is designed to assist federal agencies in their efforts to comply with the MBTA; it does not constitute any legal authorization to take migratory birds. Migratory birds could nest in the BSA. The discussion of nesting migratory birds in Chapter 4 describes potential project impacts on migratory birds and measures to avoid or minimize impacts on those species.

2.1.1.7 Clean Water Act

The CWA was passed by Congress in 1972 with a broad mandate "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The chief purpose of the CWA is to establish the basic structure for regulating discharges of pollutants into waters of the United States. The CWA authorizes the U.S. Environmental Protection Agency (EPA) to set national water quality standards and effluent limitations, and includes programs addressing both point-source and nonpoint-source pollution. *Point-source pollution* is pollution that originates or enters surface waters at a single, discrete location, such as an outfall structure or an excavation or construction site. *Nonpoint-source pollution* originates over a broader area and includes urban contaminants in storm water runoff and sediment loading from upstream areas. The CWA

operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit; permit review is the CWA's primary regulatory tool. Aquatic resources (i.e., channelized features, wetlands) are present in the BSA and may be regulated under CWA Section 404 (described below).

Section 401: Water Quality Certification

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must apply for water quality certification from the State. Therefore, all projects with a federal component that may affect state water quality (including projects that require federal agency approval, such as a Section 404 permit) must comply with CWA Section 401. Aquatic resources that appear to qualify as waters of the United States are present in the BSA.

As currently designed, roadway and bridge construction associated with the proposed project is expected to result in a discharge of pollutants into waters of the United States; therefore, a Section 401 water quality certification from the Central Valley Regional Water Control Board (RWQCB) would likely be required for the proposed project.

Section 402: Permits for Stormwater Discharge

CWA Section 402 regulates construction-related storm water discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program, administered by EPA. In California, the State Water Resources Control Board (State Water Board) is authorized by EPA to oversee the NPDES program through the RWQCB.

NPDES permits are required for projects that disturb more than 1 acre of land. The NPDES permitting process requires the applicant to file a public notice of intent to discharge storm water and to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must include a site map, a description of proposed construction activities, and the BMPs that will be implemented to prevent soil erosion and discharge of other construction-related pollutants (e.g., petroleum products, solvents, paints, and cement) that could contaminate nearby water resources. Permittees are required to conduct annual monitoring and reporting to ensure that BMPs are correctly implemented and effective in controlling the discharge of storm water-related pollutants. Because the proposed project would disturb more than 1 acre of land, the project proponent will prepare a SWPPP and apply for an NPDES permit.

Section 404: Permits for Fill Placement in Waters of the United States (Including Wetlands)

Waters of the United States (including wetlands) are protected under Section 404 of the CWA. Any activity that involves a discharge of dredged or fill material into waters of the United States,

including wetlands, is subject to regulation by the USACE. *Waters of the United States* is defined to encompass navigable waters of the United States; interstate waters; all other waters where their use, degradation, or destruction could affect interstate or foreign commerce; tributaries of any of these waters; and wetlands that meet any of these criteria or are adjacent to any of these waters or their tributaries. *Wetlands* are defined under Section 404 as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Jurisdictional wetlands must meet three wetland delineation criteria.

- They support hydrophytic vegetation (i.e., plants that grow in saturated soil).
- They have hydric soil types (i.e., soils that are wet or moist enough to develop anaerobic conditions).
- They have wetland hydrology.

As currently designed, roadway and bridge construction associated with the proposed project is expected to result in a discharge of fill material into potential waters of the United States; therefore, a Section 404 CWA permit likely will be required for the proposed project. A delineation of waters of the United States has been completed for the project and is contained in Appendix A of this NES. The wetland delineation report will be submitted to the USACE to support a preliminary jurisdictional determination for the project.

Rivers and Harbors Appropriation Act of 1899

The River and Harbors Appropriation Act of 1899 (RHA) addresses activities that involve the construction of dams, bridges, dikes, and other structures across any navigable water. Placing obstructions to navigation outside established federal lines and excavating from or depositing material in such waters require permits from the USACE. The Sacramento River is a navigable water subject to the requirements of the RHA.

Section 9 and the General Bridge Act of 1946

Section 9 (33 USC 403) of the RHA and the General Bridge Act of 1946 require that the location and plans of bridges and causeways across navigable waters be submitted to and approved by the Secretary of Homeland Security prior to their construction. Under the authority of these acts, the USCG regulates the placement of bridges across navigable waters, such as the Sacramento River. Construction of the proposed bridge will require a bridge permit from the USCG District 11.

Section 10

Section 10 (33 USC 403) of the RHA prohibits the unauthorized obstruction or alteration of any navigable water of the United States. Under Section 10, a permit is required for work or

structures in, over, or under navigable waters of the United States. Construction of the proposed bridge will require a Section 10 permit from the USACE.

2.1.2 State Regulations

2.1.2.1 California Endangered Species Act

The California Endangered Species Act (CESA) (California Fish and Game Code [CFGC] Section 2050 et seq.) establishes state policy to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA mandates that state agencies should not approve projects that jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. For projects that would affect a species on the federal and state lists, compliance with ESA satisfies CESA if the California Department of Fish and Wildlife (CDFW) determines that the federal incidental take authorization is consistent with CESA under CFGC Section 2080.1 (consistency determination). Consistency determinations allow an applicant who has obtained a federal incidental take statement (Section 7 consultation) or a federal Section 10(a) incidental take permit to submit the federal incidental take statement or permit to the CDFW Director for a determination as to whether the federal document is "consistent" with CESA. However, consistency determinations can be used only for species that are listed under both the federal ESA and CESA, and cannot be applied to species that are listed by the state but are not federally listed. For projects that would result in take of a species that is only state listed, the project proponent must apply for a take permit under Section 2081(b). Five state-listed species—Swainson's hawk (*Buteo swainsoni*), Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, delta smelt, and longfin smelt (*Spirinchus thaleichthys*)—are known or have the potential to occur in the BSA and be affected by the proposed project (Swainson's hawk and longfin smelt are only state listed). Chapter 4 describes potential project-related impacts and identifies avoidance and minimization measures that will avoid direct impacts and minimize indirect impacts on these species. Because CDFW's Bay Delta Region is no longer issuing consistency determinations and two species (Swainson's hawk and longfin smelt) are only state listed, a Section 2081 Incidental Take Permit Application will be prepared to address the potential for take of Swainson's hawk, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, delta smelt, and longfin smelt.

2.1.2.2 California Environmental Quality Act

CEQA is the regulatory framework by which California public agencies identify and mitigate significant environmental impacts. A project normally is considered to cause a significant environmental impact on biological resources if it would substantially affect a rare or endangered species or the habitat of that species; substantially interfere with the movement of resident or

migratory fish or wildlife; or substantially diminish habitat for fish, wildlife, or plants. The State CEQA Guidelines define *rare, threatened, and endangered species* as those listed under the ESA and CESA and any other species that meets the criteria of the resource agencies or local agencies (e.g., CDFW-designated species of special concern). The State CEQA Guidelines state that the lead agency preparing an Environmental Impact Report (EIR) must consult with and receive written findings from CDFW concerning project impacts on species listed as endangered or threatened. The impacts of a proposed project on these resources are important in determining whether the project would result in significant environmental impacts under CEQA. The project proponent will be preparing an EIR to comply with the State CEQA Guidelines.

2.1.2.3 California Native Plant Protection Act

The California Native Plant Protection Act (CNPPA) of 1977 prohibits importation of rare and endangered plants into California, take of rare and endangered plants, and sale of rare and endangered plants. CESA defers to the CNPPA, which ensures that state-listed plant species are protected when state agencies are involved in projects subject to CEQA. In this case, plants listed as rare under the CNPPA are not protected under CESA but rather under CEQA. Three special-status plant species known to occur in the project region (i.e., within a 10-mile radius of the BSA) are listed as rare under the CNPPA. None of these species were observed in the BSA during the field surveys. Chapters 3 and 4 discuss the potential for special-status plants to occur in the BSA.

2.1.2.4 California Fish and Game Code

Several sections of the CFGC apply to the proposed project, as described below.

Lake or Streambed Alteration (Section 1602)

CDFW regulates activities that would interfere with the natural flow of—or substantially alter the channel, bed, or bank of—a lake, river, or stream, including disturbance of riparian vegetation, under CFGC Sections 1600–1616. CDFW requires a Lake or Streambed Alteration Agreement (LSAA) permit for these activities. Requirements to protect the integrity of biological resources and water quality often are conditions of LSAAs. CDFW may establish conditions that include avoiding or minimizing vegetation removal, using standard erosion control measures, limiting the use of heavy equipment, limiting work periods to avoid impacts on fisheries and wildlife resources, and restoring degraded sites or compensating for permanent habitat losses. Waters of the State (i.e., perennial, ephemeral, and intermittent streams) that would be regulated by CDFW are present in the BSA.

The proposed project is expected to result in modification of the bed, bank, or channel of a stream and removal of riparian vegetation adjacent to a stream; therefore, a LSAA will be required.

Protection of Birds and Raptors (Sections 3503 and 3503.5)

Section 3503 of the CFGC prohibits killing of birds and destruction of bird nests. Section 3503.5 prohibits killing of raptor species and destruction of raptor nests. Typical violations include destruction of active bird and raptor nests as a result of tree removal, and failure of nesting attempts (loss of eggs or young) as a result of disturbance of nesting pairs caused by nearby human activity.

The proposed project has the potential to adversely affect birds and raptors protected under Sections 3503 and 3503.5 of the CFGC. The project proponent will avoid violation of CFGC Sections 3503 and 3503.5 by implementing measures identified for nesting birds in Chapter 4.

Fully Protected Species (Sections 3511, 3513, 4700, and 5050)

CFGC Sections 3511, 3513, 4700, and 5050 pertain to fully protected wildlife species (birds in Sections 3511 and 3513, mammals in Section 4700, and reptiles and amphibians in Section 5050) and strictly prohibit take of these species. CDFW cannot issue a take permit for fully protected species, except under narrow conditions for scientific research or the protection of livestock, or if a Natural Community Conservation Plan (NCCP) has been adopted. Specifically, Section 3513 prohibits any take or possession of birds designated by the MBTA as migratory nongame birds except as allowed by federal rules and regulations pursuant to the MBTA.

One fully protected bird species, white-tailed kite (*Elanus leucurus*), has the potential to nest in the BSA and be affected by the proposed project. The project proponent would avoid take of white-tailed kite by implementing measures identified for nesting birds in Chapter 4.

2.1.2.5 Porter-Cologne Water Quality Control Act

The California Water Code addresses the full range of water issues in the state and includes Division 7, known as the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) (California Water Code Sections 13000–16104). Section 13260 requires “any person discharging waste, or proposing to discharge waste, in any region that could affect the waters of the State to file a report of discharge (an application for waste discharge requirements [WDRs])” with the appropriate RWQCB. Under this act, each of the nine RWQCBs must prepare and periodically update Water Quality Control Basin Plans (Basin Plans). Each Basin Plan sets forth water quality standards for surface water and groundwater, as well as actions to control nonpoint and point sources of pollution. Projects that affect waters of the State must meet the WDRs of the RWQCB. Pursuant to CWA Section 401, an applicant for a Section 404 permit to conduct any activity that may result in discharge into navigable waters must provide a certification from the RWQCB that such discharge will comply with state water quality standards. As part of the wetlands permitting process under Section 404, the project proponent will be required to apply for water quality certification from the Central Valley RWQCB.

Section 13050 of the Porter-Cologne Act authorizes the State Water Board and the relevant RWQCB to regulate biological pollutants. The California Water Code generally regulates more substances contained in discharges and defines discharges to receiving waters more broadly than does the CWA.

As currently designed, roadway and bridge construction associated with the proposed project is expected to result in a discharge of fill material into waters of the State; therefore, the RWQCB is likely to issue WDRs for the proposed project.

2.1.2.6 Central Valley Flood Protection Plan: Levee Vegetation Management Strategy

Under the Central Valley Flood Protection Act of 2008, the California Department of Water Resources (DWR) developed the 2012 Central Valley Flood Protection Plan (CVFPP) as the foundation for the statewide FloodSAFE California initiative (California Department of Water Resources 2012a). Part of the CVFPP is a strategy for managing levee vegetation. Based on this strategy, existing trees on levees will be allowed to live out their normal life cycles unless they pose an unacceptable threat to levee integrity.

2.1.2.7 Urban Levee Design Criteria

The Urban Levee Design Criteria (ULDC) are intended to supply engineering guidance and criteria for levees required to provide an urban level of flood protection (200-year flood) (California Department of Water Resources 2012b). The ULDC also correspond to the CVFPP Levee Vegetation Management Strategy. With regard to levee improvements, the ULDC state the following.

> In cases of levee repair or improvement, vegetation shall be removed as required to meet objectives of the specific project. Vegetation removed as part of direct construction activities may not be replaced in the vegetation management zone. However, vegetation on other sections of the levee, not affected by the construction activity may remain in place, natural revegetation may be allowed outside of the vegetation management zone, and replanting may be allowed… Trees and other woody vegetation may be: (1) planted, and (2) allowed to naturally revegetate on a landside planting berm. Only the portion of the landside planting berm that is both 15 feet or more from the landside levee slope and 15 feet or more from the landward top of the planting berm may be planted and allowed to naturally revegetate.

2.1.3 Local Regulations

2.1.3.1 City of Sacramento General Plan

Goals and policies in the City of Sacramento General Plan (Part 2, Environmental Resources section) (City of Sacramento 2009) apply to biological resources in the proposed project area that would be affected by implementation of the project. These policies include conservation of open space areas to protect creeks and the Sacramento River; preservation of natural habitats; retention of sensitive habitats and species; preservation of riparian habitats or mitigation by

preservation and/or restoration at a 1:1 ratio; preservation of wetlands or mitigation for no-net-loss of value and/or function; preservation of wildlife corridors or replacement with habitat of equivalent value; performance of sensitive species surveys and/or habitat assessments and, if suitable habitat is present for a species, performance of either protocol-level or industry-recognized species surveys or assumption of species presence and consultation with appropriate resource agencies and mitigation in compliance with state and federal laws; and retention of heritage trees.

2.1.3.2 City of West Sacramento General Plan

Goals and policies in the City of West Sacramento General Plan (Part II, Section 6) (City of West Sacramento 2004) apply to biological resources in the BSA that would be affected by implementation of the project. These policies include preservation, enhancement, and no net loss of riparian and wetland habitats, particularly at the Sacramento River; requirements for site-specific vegetation surveys; development setbacks from wetlands; preservation of special-status species populations; minimization of recreational use effects on riparian habitat; and promotion of using native plants for landscaping near the Sacramento River.

2.1.3.3 City of Sacramento Heritage Tree Ordinance

The City Heritage Tree Ordinance (City of Sacramento Municipal Code, Title 12, Chapter 12.64) defines a heritage tree as follows.

- Any tree or any species with a truck circumference of one hundred (100) inches [diameter of 32 inches] or more, which is of good quality in terms of health, vigor of growth and conformity to generally accepted horticultural standards of shape and location for its species.
- Any native *Quercus* species, *Aesculus californica* or *Platanus racemosa*, having a circumference of thirty-six (36) inches [diameter of 11.5 inches] or greater when a single trunk, or a cumulative circumference of thirty-six (36) inches or greater when a multi-trunk.
- Any tree thirty-six (36) inches in circumference [diameter of 11.5 inches] or greater in a riparian zone. The riparian zone is measured from the center line of the watercourse to thirty (30) feet beyond the high water line.
- Any tree, grove of trees or woodland trees designated by resolution of the city council to be of special historical or environmental value or of significant community benefit.

The ordinance states that, during construction activity on any property on which a heritage tree is located, unless the express written permission of the director is first obtained, no person shall:

- Change the amount of irrigation provided to any heritage tree from that provided prior to the commencement of construction activity.
- Trench, grade, or pave into the dripline area of a heritage tree, or trim roots.

- Change, by more than 2 feet, grade elevations within thirty (30) feet of the dripline area of a heritage tree.
- Park or operate any motor vehicle within the dripline area of any heritage tree.
- Place or store any equipment or construction materials within the dripline area of any heritage tree.
- Attach any signs, ropes, cables or any other items to any heritage tree.
- Cut or trim any branch of a heritage tree for temporary construction purposes.
- Place or allow to flow into or over the dripline area of any heritage tree any oil, fuel, concrete mix, or other deleterious substance.

In addition, the ordinance states that none of the following activities shall be performed without a tree permit.

- Removal of any heritage tree.
- Pruning or spraying of any heritage tree greater than 12 inches in circumference.
- Disturbing the soil or placing any chemical on the soil within the dripline of any heritage tree.

The BSA supports heritage trees in the City of Sacramento that would be affected by implementation of the project and would be subject to the City of Sacramento Heritage Tree Ordinance.

2.1.3.4 City of West Sacramento Tree Preservation Ordinance

The City's Tree Preservation Ordinance is found in the West Sacramento Municipal Code, Title 8 (Health and Safety), Chapter 24 (Tree Preservation). The City protects heritage and landmark trees, as defined in the ordinance, and requires tree permits for activities that would affect such trees.

A *heritage* tree is defined as follows.

- Any living tree with a trunk circumference of 75 inches (diameter of 24 inches) or more, or
- Any living native oak (any species of the genus *Quercus*) with a trunk circumference of 50 inches (diameter of 16 inches) or more, both measured 4.5 feet above ground level. The circumference of multi-trunk trees is based on the sum of the circumference of each trunk.

A *landmark* tree is defined as a tree or stand of trees that is especially prominent, stately, or of historical significance as designated by the City Council. Trees that are too small in diameter to meet the size threshold of either a heritage or landmark tree but are located within the public right-of-way (typically 12.5 feet from the curb) also are protected by the ordinance.

It is unlawful in West Sacramento to perform any of the following acts with respect to a heritage or landmark tree without a tree permit issued by the City's tree administrator.

- Move, remove, cut down, poison, set fire to or permit fire to burn in proximity to, or perform or fail to perform any act that results in the unnatural death or destruction of a landmark or heritage tree.
- Perform any activity that will interfere with or retard the natural growth of any landmark or heritage tree.
- Perform any work or permit any work to be performed within the dripline area of a landmark or heritage tree.
- Trim or prune any branch of a landmark or heritage tree that is 5 inches or more in diameter.
- Change the appropriate amount of irrigation or drainage water provided to any landmark, heritage, or street tree. Trench, grade, pave, or otherwise damage or disturb any exposed roots within 1 foot outside the dripline area of any landmark, heritage, or street tree.
- Park or operate any motor vehicle within 1 foot outside the dripline area of any landmark, heritage, or street tree.
- Place or store any equipment or construction materials within 1 foot outside the dripline area of any landmark, heritage, or street tree.
- Place, apply, or attach any signs, ropes, cables, or other items to any landmark, heritage, or street tree.
- Place or allow to flow any oil, fuel, concrete mix, or other deleterious substance into or over within 1 foot outside the dripline area of any landmark, heritage, or street tree.

Tree permits require the applicant to replace a removed tree with a living tree on the property or within West Sacramento in a location approved by the tree administrator. The applicant also must replace the replacement tree if it dies any time within 3 years of the initial planting. Replacement is not required if a tree is removed because it poses a risk or hosts a plant parasite.

Replacement trees are required at a ratio of 1:1 (i.e., 1-inch diameter of replacement plant for every 1-inch diameter of tree removed). Replacement trees may be a combination of 15-gallon trees, which are the equivalent of a 1-inch-diameter tree, or 24-inch box trees, which are the equivalent of a 3-inch-diameter tree. If a property owner is unable to replace the tree on his or her property or within an area approved by the tree administrator, the tree administrator shall require the property owner to pay an in-lieu fee to the city. An in-lieu fee payment is not required if the tree needs to be removed solely because it poses a risk to persons or property, or if the tree acts as a host for a plant that is parasitic. In-lieu fees will be set by City Council resolution and be used to purchase and plant trees elsewhere in West Sacramento.

The BSA supports heritage trees in West Sacramento that would be affected by implementation of the project and would be subject to the City of West Sacramento Tree Preservation Ordinance.

2.2 Studies Required

Potential biological resource issues associated with the proposed project were identified through review of existing information and field surveys. It was determined that the following studies and surveys would be required to document natural resources in the BSA.

- General habitat evaluation to determine whether suitable habitat exists for special-status plant and animal species.
- Focused elderberry shrub survey and stem counts to document suitable habitat for the federally listed valley elderberry longhorn beetle.
- Bat survey consisting of identifying potential and occupied bat roosts and conducting acoustic surveys.
- Botanical field surveys to map land cover types, including natural communities, and survey for special-status plant species.
- Delineation of waters of the United States and waters of the State.
- General stream habitat survey to evaluate the occurrence and extent of shaded riverine aquatic (SRA) cover, including overhead vegetation, undercut banks, and instream woody material that exists for special-status fish species in the BSA.
- Standard Assessment Methodology (SAM) to assess existing habitat conditions and evaluate the impacts and compensation requirements based on the needs of listed fish species.

To prepare for the field surveys, biologists reviewed existing resource information related to the project to evaluate whether special-status species or other sensitive biological resources (e.g., waters of the United States) could occur in the BSA. As this document was prepared and revised, updated versions of the resources were obtained, reviewed, and incorporated. The sources listed below were reviewed.

- California Native Plant Society's (CNPS's) online Inventory of Rare and Endangered Plants of California records search of the Sacramento West, Clarksburg, Saxon, Rio Linda, Sacramento East, Florin, Taylor Monument, Grays Bend, and Davis U.S. Geological Survey (USGS) 7.5-minute quadrangles (California Native Plant Society 2015) (Appendix B).
- California Natural Diversity Database (CNDDB) records search of the Sacramento West, Clarksburg, Saxon, Rio Linda, Sacramento East, Florin, Taylor Monument, Grays Bend, and Davis USGS 7.5-minute quadrangles (California Department of Fish and Wildlife 2015) (Appendix B).
- A list of endangered and threatened species that may occur in or be affected by projects within the Sacramento West USGS 7.5-minute quadrangle and Yolo and Sacramento Counties (U.S. Fish and Wildlife Service 2015a) (Appendix B).

- Lists of plants identified as noxious weeds or invasive plants by the U.S. Department of Agriculture (USDA) (Natural Resources Conservation Service 2014a), the California Department of Food and Agriculture (CDFA) (Natural Resources Conservation Service 2003) and the California Invasive Plant Council (Cal-IPC) (2006, 2007).
- Soil map unit descriptions for the BSA (Natural Resources Conservation Service 2014b).

This information was used to develop lists of special-status species and other sensitive biological resources that could be present in the project region. Species from the lists were considered if they were known to occur in the project region or had potential habitat in the BSA and the BSA was within the species' range.

2.3 Personnel and Survey Dates

ICF International (ICF) biologists conducted biological surveys in the BSA in 2014 and 2015 (Table 2-1). Methods and personnel involved in documenting wetlands and other waters of the United States and conducting botanical, wildlife, and SRA cover habitat surveys are described below. Representative photographs taken during field surveys are provided in Appendix C.

Table 2-1. Biological Survey Personnel and Dates

Survey Type	Survey Date	Surveyors
Natural communities and habitat-based assessment for special-status species	April 14, 2014	John Howe, ICF Wildlife Biologist, 18 yrs. experience Lisa Webber, ICF Botanist/Wetland Ecologist, 25 yrs. experience
Botanical surveys	April 14, 2014; and April 8, May 8, and June 17, 2015	Lisa Webber
Delineation of waters of the United States and waters of the State	April 8, 2015	Lisa Webber
Wildlife habitat assessment and elderberry shrub survey	April 8, 2015	John Howe
Bat habitat mapping and acoustic surveys	May 5 and June 11, 2015	John Howe Leila Harris, ICF Wildlife Biologist, 8 yrs. experience
Shaded riverine aquatic cover habitat survey, fish passage reconnaissance assessment, and Standard Assessment Methodology	May 8 and June 17, 2015	Jeff Kozlowski, ICF Fisheries Biologist, 29 yrs. experience Rita Wilson, ICF Research Assistant, 1 yr. experience

2.3.1 Waters of the United States, Including Wetlands

ICF botanist/wetland ecologist Lisa Webber conducted delineation field work in the BSA on April 8, 2015. The delineation was conducted using the routine onsite determination method described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental

Laboratory 1987) and the supplemental procedures and wetland indicators provided in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (U.S. Army Corps of Engineers 2008). The wetland delineation letter report is included as Appendix A.

2.3.2 Botanical Resources

ICF botanist Lisa Webber conducted botanical surveys in the BSA on April 14, 2014, and on April 8, May 8, and June 17, 2015. The spring and summer surveys coincided with the identification periods of special-status plants with potential to occur in the project region. During all but the June 17, 2015 surveys, the botanist walked the entire BSA and compiled lists of plants species observed. For the June 17, 2015 survey, close-up photographs of the banks were taken from the river via a kayak and then examined for the presence of special-status plants, in particular woolly rose-mallow. One part of the bank in West Sacramento was then walked to confirm the absence of woolly rose-mallow. A list of plant species observed in the BSA is included as Appendix D. Natural communities in the BSA also were identified and mapped during the botanical field surveys. The results of these surveys are presented in Chapters 3 and 4.

2.3.3 Wildlife Resources

ICF biologist John Howe conducted habitat-based field assessments for wildlife in the BSA on April 14, 2014, and on April 8, 2015. During the assessments, Mr. Howe took notes on the general topography of the BSA, the vegetation present, and the amount of human activity/disturbance at the site; he recorded wildlife (or wildlife signs) observed during the visit. During the April 8, 2015 site visit, Mr. Howe performed an elderberry shrub survey to document the location of elderberry shrubs (the host plant for valley elderberry longhorn beetle) present in the project limits and within 100 feet of the project limits. During the elderberry shrub survey, Mr. Howe recorded information on the number and size of stems, presence or absence of exit holes, and habitat associations. A list of wildlife species observed in the BSA is provided in Chapter 3.

In addition, on May 5 and June 11, 2015, Mr. Howe and ICF biologist Leila Harris mapped potential and occupied bat habitat, and conducted nighttime acoustic surveys within the BSA. Acoustic surveys were conducted using two Pettersson ultrasonic bat detectors, and recordings were processed using Sonobat software—a comprehensive tool for analyzing and comparing high-resolution, full-spectrum sonograms of bat echolocation calls.

The results of the wildlife surveys are presented in Chapters 3 and 4.

2.3.4 Fisheries Resources

On May 8, 2015, ICF fish biologist Jeff Kozlowski, accompanied by Rita Wilson, conducted an SRA cover habitat survey, a fish passage reconnaissance assessment, and a general reconnaissance-level field survey of the Sacramento River within the BSA. The reconnaissance-level field survey focused on evaluating existing habitat conditions within the BSA relative to the needs of special-status fish species. In addition, Jeff Kozlowski and Rita Wilson took photographs of the banks and levees from the Sacramento River on June 17, 2015, for application of the SAM analysis. No special-status fish surveys were conducted for the proposed project.

2.4 Agency Coordination and Professional Contacts

The following agency coordination has been conducted for the project.

2.4.1 Caltrans Office of Local Assistance

On June 25, 2014, Caltrans biologist Maureen Doyle with District 3 participated in a site visit within the BSA in the City of Sacramento and the City of West Sacramento to review and discuss the Preliminary Environmental Study (PES) with project representatives from the Cities of Sacramento and West Sacramento, management and engineering representatives from Mark Thomas and Company, and ICF project management and technical specialist representatives (including John Howe and Lisa Webber).

On June 3, 2015, Caltrans biologist Jennifer Osmondson, ICF biologist John Howe, and ICF botanist/wetland ecologist Lisa Webber participated in a conference call to discuss proposed mitigation for sensitive biological resources.

On June 11, 2015, Ms. Osmondson and Ms. Webber discussed by phone the format of the letter report for the delineation of waters of the United States to be submitted to the USACE.

On October 28, 2015, Ms. Osmondson sent to the NMFS, USFWS, USACE, and CDFW an email invitation for a November 17, 2015 resource agency meeting and site visit with project representatives from the Cities of Sacramento and West Sacramento, management and engineering representatives from Mark Thomas and Company, and ICF project management and technical specialist representatives. The purpose of the meeting was to discuss the design of the project and the potential biological impacts, and to get feedback from the agencies regarding likely mitigation requirements.

On November 17, 2015, Ms. Osmondsonand representatives of the Cities of Sacramento and West Sacramento, Caltrans and members of the project consulting team, including Ms. Webber,

Mr. Howe, and Mr. Kozlowski, attended the resource agency meeting. A summary of the proposed project and preliminary impact results was provided and input from the agencies regarding the impacts and likely mitigation requirements was solicited.

2.4.2 National Marine Fisheries Service

On June 9, 2015, Jeff Kozlowski, on behalf of Caltrans and the City of Sacramento, and in cooperation with the City of West Sacramento, requested a species list from Maria Rea, Assistant Regional Administrator for NMFS' California Central Valley Area Office for the project.

On November 17, 2015, Lieutenant Junior Grade Sean Luis attended the resource agency meeting and offered initial feedback regarding the project and in-water work windows.

2.4.3 U.S. Fish and Wildlife Service

On November 17, 2015, Mr. Armin Halston attended the resource agency meeting and offered initial feedback regarding the project. Mr. Halston was not able to participate for the full duration of the meeting or the site visit.

2.4.4 U.S. Army Corp of Engineers

Staff from the U.S. Army Corp of Engineers was invited to attend the November 17, 2015 resource agency meeting but no representatives attended the meeting.

2.4.5 California Department of Fish and Wildlife

On November 17, 2015, Ms. Tanya Sheya attended the resource agency meeting and offered initial feedback regarding the project and mitigation requirements.

2.4.6 State Lands Commission

There has been no consultation with the State Lands Commission (SLC) to date, but a Land Use Lease will be required for bridge construction in the Sacramento River.

2.5 Limitations That May Influence Results

The botanical surveys were conducted during the reported blooming periods for all of the special-status plants identified as having potential habitat in the BSA. The potential for occurrence of special-status plants in the BSA is generally low, due to historical and ongoing disturbance of the area for development, agriculture, and flood control. Although plant surveys were conducted during a drought period, the special-status species with potential habitat in the BSA would all grow on the Sacramento River banks. The river banks did not experience substantially drier conditions than normal due to the presence of normal river water levels; therefore, the drought conditions would not be expected to affect the growth of special-status plants along the river.

At the time of the delineation fieldwork, indicators of hydrophytic vegetation, hydric soils, wetland hydrology, and the mean high water line were evident and identifiable. Therefore, there were no limitations with regard to the survey for wetlands and other waters in the BSA.

Focused nesting bird surveys (including surveys for Swainson's hawk) were not conducted as part of the wildlife surveys. Based on the large population of nesting Swainson's hawk along the Sacramento River and their historical use of riparian habitat in the project vicinity, there is a high likelihood that Swainson's hawks could nest in or adjacent to the study area during construction. However, the presence of an active nest in one particular year is not a clear indication of where Swainson's hawks may nest in the year of construction. Therefore, for purposes of assessing impacts on Swainson's hawk, it was assumed that they are present in the BSA.

The assumed presence of, and the impact assessment on, special-status fish species depends largely on previously collected data; literature reviews; and general species distribution, habitat requirements, and life history accounts. As stated previously, no fish surveys were conducted, and this NES assumes that seven listed fish species (Sacramento winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley fall- and late fall–run Chinook salmon, Central Valley steelhead, North American green sturgeon, delta smelt, and longfin smelt), and two California species of special concern (Sacramento splittail [*Pogonichthys macrolepidotus*] and river lamprey [*Lampetra ayresi*]) are present in the BSA.

Chapter 3 Results: Environmental Setting

This chapter defines the BSA for the proposed project and describes the existing physical and biological conditions within the BSA.

3.1 Existing Biological and Physical Conditions

3.1.1 Biological Study Area

The extent of the BSA, which includes all permanent and temporary project impact areas, is shown in Figure 3-1. The BSA consists of the Sacramento River, riparian woodland and open space with bike/pedestrian trails along the Sacramento River, local roads, elevated roads (viaducts) and bridge approach structures, residential areas, and commercial development. The BSA has a relatively high level of historical and ongoing disturbance.

3.1.2 Physical Conditions

The BSA is located in the Sacramento Valley subregion of the California Floristic Province (Baldwin et al. 2012:43). The topography in the BSA varies from relatively level to moderate slopes on the Sacramento River levees, and elevations range from approximately -6 to 64 feet above mean sea level.

According to soil data from the Natural Resources Conservation Service, the BSA contains the following five soil map units and water (Natural Resources Conservation Service 2014a).

- Orthents-Urban land complex, 0 to 2 percent slopes (Sacramento County)
- Urban land (Sacramento County)
- Lang sandy loam (Yolo County)
- Lang sandy loam, deep (Yolo County)
- Sycamore silt loam (Yolo County)

The soil profile has been disturbed by development in West Sacramento and construction activity in the Sacramento Railyards area.

The BSA is within the Lower Sacramento watershed hydrologic unit (hydrologic unit code [HUC] 18020109) (U.S. Environmental Protection Agency 2015). The primary river in the delineation area is the Sacramento River, a traditional navigable water (TNW) that qualifies as another water of the United States (which also is considered a water of the State). The specific characteristics of waters of the United States (including wetlands) in

the BSA are further described below in the "Natural Communities" section and in the wetland delineation report (Appendix A).

3.1.3 Biological Conditions

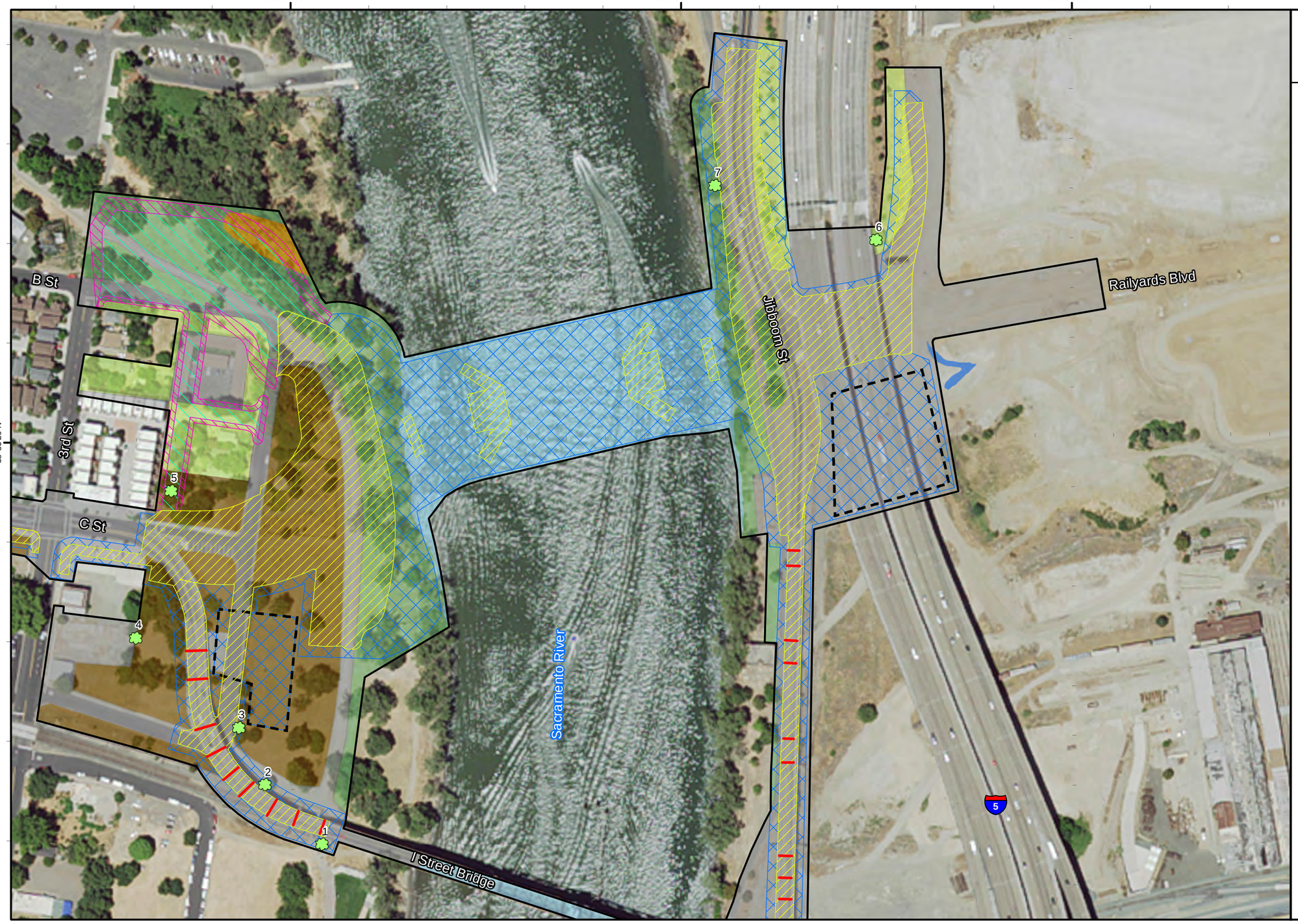
3.1.3.1 Natural Communities

The natural communities in the BSA are interspersed with roadways, railroad tracks, commercial and industrial areas, and residential development. The term *land cover type* is used in this NES to refer to vegetation communities, open water, and unvegetated developed or disturbed areas. Land cover types mapped during field surveys are described below and shown in Figure 3-1. Representative photographs of land cover types within the BSA are provided in Appendix C.

The BSA supports both common vegetation communities and natural communities of special concern. Common vegetation communities are habitats with low species diversity that are widespread, reestablish naturally after disturbance, or support primarily non-native species. These communities generally are not protected by agencies unless the specific site is habitat for or supports special-status species (e.g., raptor foraging or nesting habitat, upland habitat in a wetland watershed). Common vegetation communities in the BSA are ruderal woodland and landscaped areas.

Natural communities of special concern are habitats considered sensitive because of their high species diversity, high productivity, unusual nature, limited distribution, or declining status. Local, state, and federal agencies consider these habitats important. The CNDDB contains a current list of rare natural communities throughout the state. USFWS considers certain habitats, such as wetlands and riparian communities, important to wildlife; and the USACE and EPA consider wetland habitats important for water quality and wildlife. The habitats in the BSA that meet the criteria for natural communities of special concern are cottonwood riparian forest and riparian forest/shrub wetland. Perennial stream, although not a vegetation community, is included as a natural community of special concern because it is important wildlife and fish habitat, and is regulated by resource agencies.

The distribution, representative vegetation, and typical wildlife species found in land cover types within the BSA are described below. Lists of plant species observed in the BSA are included in Appendix D and a list of wildlife species observed in the BSA is presented in Section 3.1.3.2, *Common Animal Species*.



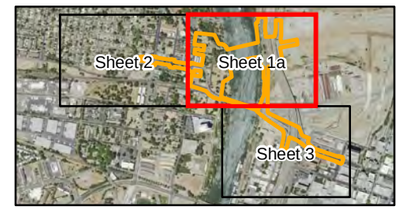
I Street Bridge Replacement Project
Sheet 1a

Legend

- Biological Study Area
- Permanent Impacts Common to All Alternatives
- Residential Access Alternative 1 Permanent Impacts
- Temporary Impacts Common to All Alternatives
- Residential Access Alternative 1 Temporary Impacts
- Staging
- Elderberry Shrubs
- Bat Roosts on Viaducts

Land Cover Types

- Cottonwood Riparian Forest
- Developed/Graded
- Landscaped
- Riparian Forest/Shrub Wetland
- Ruderal Woodland
- Temporary Detention Basin
- Tidal Perennial Stream



N

0 100 200 400
Feet

1 inch = 200 feet

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Figure 3-1
Impacts on Landcover Types and Sensitive Biological Resources in the Biological Study Area

121°30'30"W
121°30'20"W
121°30'10"W
38°35'20"N
B St
3rd St
C St
Jibboom St
Railyards Blvd
Sacramento River
I Street Bridge
5
1
2
3
4
5
6
7
I Street Bridge Replacement Project
Sheet 1b
Legend
Biological Study Area
Permanent Impacts Common to All Alternatives
Residential Access Alternative 2 Permanent Impacts
Temporary Impacts Common to All Alternatives
Residential Access Alternative 2 Temporary Impacts
Staging
Elderberry Shrubs
Bat Roosts on Viaducts
Land Cover Types
Cottonwood Riparian Forest
Developed/Graded
Landscaped
Riparian Forest/Shrub Wetland
Ruderal Woodland
Temporary Detention Basin
Tidal Perennial Stream
Sheet 2
Sheet 1a
Sheet 3
N
0
100
200
400
Feet
1 inch = 200 feet
Path: K:\Projects_1\mark_thomas\00203_14_1_St_Bridge\mapdoc\Bio\Biological_Resources_Alt2_20150701.mxd; Author: ; Date: 7/14/2015

Figure 3-1
Impacts on Landcover Types and Sensitive Biological Resources in the Biological Study Area

121°31'0"W

121°30'50"W

121°30'40"W

38°35'20"N

B St

Metro Lane

C St

5th St

4th St

6th St

Sacramento Ave

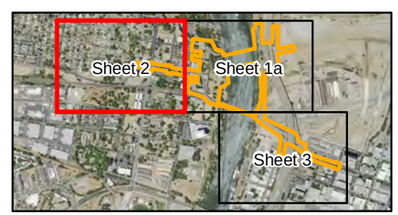
I Street Bridge Replacement Project
Sheet 2

Legend

- Biological Study Area
- Permanent Impacts Common to All Alternatives
- Temporary Impacts Common to All Alternatives

Land Cover Types

- Developed/Graded
- Landscaped
- Ruderal Woodland



N

0 100 200 400
Feet

1 inch = 200 feet

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Figure 3-1
Impacts on Landcover Types and Sensitive Biological Resources in the Biological Study Area

121°30'20"W

121°30'10"W

121°30'0"W

38°35'10"N

38°35'0"N

I Street Bridge

Sacramento River

5

I St

I Street Bridge Replacement Project
Sheet 3

Legend

- Biological Study Area
- Permanent Impacts Common to All Alternatives
- Temporary Impacts Common to All Alternatives
- Bat Roosts on Viaducts
- Purple Martin Colony

Land Cover Types

- Developed/Graded
- Landscaped
- Tidal Perennial Stream

N

0 100 200 400
Feet

1 inch = 200 feet

Path: K:\Projects_1\mark_thomas\002203_14_1_St_Bridge\mapdoc\Bio\Biological_Resources_Alt1_20150701.mxd; Author: ; Date: 7/14/2015

Figure 3-1
Impacts on Landcover Types and Sensitive Biological Resources in the Biological Study Area

Cottonwood Riparian Forest

Cottonwood riparian forest in the BSA occurs along the upper banks and floodplains of the Sacramento River (Figure 3-1). The overstory of riparian forest is predominantly mature Fremont cottonwood (*Populus fremontii*) trees associated with valley oak (*Quercus lobata*) and black walnut (*Juglans californica* var. *hindsii)*. Other riparian tree species observed include Oregon ash (*Fraxinus latifolia*), boxelder (*Acer negundo* var. *californicum*), and black willow (*Salix gooddingii*). The riparian understory on the waterside of the levee is primarily rip-rap with non-native annual grasses and forbs; however, there are also patches of more typical riparian species, such as narrow-leaf willow (*Salix exigua*), Himalayan blackberry (*Rubus armeniacus*), and mugwort (*Artemisia douglasiana*). The invasive red sesbania (*Sesbania punicea*) shrub was observed in the riparian forest on the Sacramento side of the river. One blue elderberry shrub (*Sambucus nigra* ssp. *caerulea*), habitat for the federally threatened valley elderberry longhorn beetle (VELB), was found in riparian habitat on the Sacramento side of the river. One area of riparian forest exhibited positive indicators of all three federal wetland criteria and is discussed below under "Riparian Forest/Shrub Wetland." Riparian forest associated with the Sacramento River in the BSA is depicted in Photos 1 and 2 in Appendix C.

Riparian habitats are sensitive natural communities that provide important habitat for wildlife and shaded riverine habitat for fish. Local, state, and federal agencies recognize riparian habitats as sensitive natural communities.

Riparian habitats provide cover, foraging and nesting habitat, and serve as migration and dispersal corridors for several bird and mammal species in the region. Common wildlife species that may occur in these habitats include black phoebe (*Sayornis nigricans*), yellow-rumped warbler (*Dendroica coronata*), house finch (*Carpodacus mexicanus*), American goldfinch (*Carduelis tristis*), yellow-billed magpie (*Pica nuttalli*), pocket gopher (*Thomomys bottae*), fox squirrel (*Sciurus niger*), common muskrat (*Ondatra zibethicus*), and raccoon (*Procyon lotor*).

Riparian Forest/Shrub Wetland

Riparian forest/shrub wetland occurs in the BSA within riparian habitat that meets all three federal wetland criteria (i.e., hydrophytic vegetation, hydric soils, and wetland hydrology). The riparian forest/shrub wetland is located in the northern portion of the BSA, on the west side of the Sacramento River within a low area (Figure 3-1) (Photos 3 and 4 in Appendix C). The vegetative composition of the riparian forest/shrub wetland is predominantly cottonwood but also includes buttonwillow (*Cephalanthus occidentalis*

var. *californicus*), boxelder, and narrow-leaf willow. Additional information about the riparian forest/shrub wetland is provided in the wetland delineation report (Appendix A).

As noted above, riparian wetland habitats are sensitive natural communities that provide important cover, foraging, and nesting habitat, and serve as migration and dispersal corridors for several bird and mammal species in the region. Local, state, and federal agencies recognize riparian habitats as sensitive natural communities.

Ruderal Woodland

The West Sacramento section of the BSA includes several areas of naturalized vegetation on undeveloped parcels or parts of parcels that support mature trees with ruderal or non-native annual grassland in the understory. Several parcels between 2nd Street and the levee are predominantly vegetated by the invasive species tree of heaven (*Ailanthus altissima*); several riparian trees are interspersed, including black walnut and Fremont cottonwood. Another invasive tree species, black locust (*Robinia pseudoacacia*), also grows in this area. The understory vegetation in these areas of naturalized vegetation includes non-native annual grasses and forbs, such as wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), foxtail barley (*Hordeum murinum* ssp. *leporinum*), star thistle (*Centaurea solstitialis*), vetch (*Vicia* spp.), and prickly lettuce (*Lactuca serriola*). Several blue elderberry shrubs grow in this community type (Figure 3-1). Representative photographs of ruderal woodland in the BSA are provided as Photos 5, 6, and 7 in Appendix C.

The ruderal woodland and associated ruderal grasslands provide nesting habitat for common birds, including northern mocking bird (*Mimus polyglottos*), western meadowlark (*Sturnella neglecta*), and killdeer (*Charadrius vociferous*) (in more open areas). Mallards from the adjacent river could use the denser areas of ruderal grassland for nesting. This ruderal area also provides foraging habitat for bird species. Pocket gophers are known to occur in the ruderal woodlands of the BSA.

Perennial Stream (Sacramento River)

The Sacramento River is the only perennial stream in the BSA (see Figure 3-1). All perennial stream is unvegetated open water. The river averages 672 feet wide at the ordinary high water mark (OHWM) in the BSA. The river banks are levees that are mostly steeply sloped and support riparian forest vegetation, as described above, with rip-rap near the bottom of the slope. Additional information about the perennial stream is provided in the wetland delineation report (Appendix A). Representative photographs of the Sacramento River in the BSA are provided as Photos 1 and 2 in Appendix C.

The Sacramento River is a TNW and a water of the United States subject to regulation under CWA Section 404 and Section 10 of the RHA, and is under the jurisdiction of the USACE. The river is considered a sensitive natural community. The RWQCB protects all waters of the State under the Porter-Cologne Act.

Riverine habitats like the Sacramento River provide habitat for amphibians, birds, and mammals. Common wildlife species that could be found in the river and along the shore of the river include American bullfrog (*Lithobates catesbeianus*), mallard (*Anas platyrhynchos*), great egret (*Ardea alba*), and river otter (*Lutra canadensis*). Numerous species of fish also are known to occur in the Sacramento River and are described below.

Landscaped

The vegetation in landscaped areas typically is comprised of ornamental species planted for decorative or landscaping purposes, including oleander (*Nerium oleander*), coast redwood (*Sequoia sempervirens*), California fan palm (*Washingtonia filifera*), Callery pear (*Pyrus calleryana*), Italian cypress (*Cupressus sempervirens*), pines (*Pinus* spp.), non-native oaks (*Quercus* sp.), and fruit trees (Figure 3-1). Landscaping is depicted in Photo 8 in Appendix C.

Common bird species may forage and nest in some of the landscaped areas, including mourning dove, American robin (*Turdus migratorius*), cliff swallow (*Petrochelidon pyrrhonota*) (nests on buildings and bridges), and western scrub jay (*Aphelocoma californica*).

Developed / Graded

Developed portions of the BSA consist of residential structures, commercial/industrial areas, and paved roadways and parking lots. Some small areas mapped as “Developed” on Figure 3-1 include landscaping, where the vegetated patches are small and interspersed with houses and other structures. Graded portions of the BSA include areas adjacent to roadways, the railroad, unpaved parking areas, and the area underneath and east of I-5. The vegetative composition of these areas is generally sparse and generally consists of nonnative species, particularly annual grasses and weedy forbs. Disturbed/ graded areas are depicted in Photos 9 and 10 in Appendix C.

Common wildlife species that would occur in developed areas would be the same as those described above in the landscaped areas.

3.1.3.2 Common Animal Species

Wildlife

The BSA supports common birds and mammals typical of both riverine, riparian, and urban areas. Wildlife species that were observed in the BSA are western fence lizard (*Sceloporus occidentalis*), great blue heron (*Ardea herodias*), Canada goose (*Branta canadensis*), white-throated swift (*Aeronautes saxatalis*), western scrub jay, northern mockingbird, European starling (*Sturnus vulgaris*), rock dove (*Columbia livia*), yellow-billed magpie, feral house cat (*Felis catus*), black-tailed jackrabbit (*Lepus californicus*), fox squirrel, raccoon (tracks), and skunk (odor) (likely *Mephitis mephitis*).

In addition, several occupied and potential bats roots were observed under the I Street (both sides of the Sacramento River) and Jibboom Street approach structures. During the May 5, 2015 bat surveys, 30 expansion joints were mapped on the approach ramps for a total of 1,132 linear feet of potential bat roosting habitat. Of the 30 expansions joints, 16 were observed to be occupied by bats at the time of the May 15, 2015 survey; they were visually identified as Mexican free-tailed bats (*Tadarida brasiliensis*). Acoustic surveys conducted on the nights of May 5 and June 11, 2015, recorded Mexican free-tailed bats, big brown bats (*Eptesicus fuscus*), Yuma myotis (*Myotis yumanensis*), and Western red bat (*Lasiurus blossevillii*)—a species of special concern.

Wildlife Migration Corridors

The BSA consists of predominantly disturbed and developed areas along both sides of the Sacramento River, with a narrow band of riparian habitat along the river. Despite these existing conditions, the open water portion of the river serves as a migration corridor for aquatic species; and, even though limited, the riparian habitat can be used by birds and other wildlife for dispersing along the Sacramento River corridor. Fish passage and migration within the Sacramento River are discussed below.

Fish

The Sacramento River in the BSA falls within the Sacramento-San Joaquin Province (Central Valley Subprovince), one of six aquatic zoogeographic provinces in California, as defined by Moyle (2002). The Sacramento-San Joaquin Province is drained by the Sacramento and San Joaquin Rivers. Generally, four native fish assemblages can be recognized in Central Valley streams: rainbow trout assemblage, California roach assemblage, pikeminnow-hardhead-sucker assemblage, and deep-bodied fish assemblage (Moyle 2002). Based on its geographic location, the BSA lies at the interface between the zone characterized by the deep-bodied fish assemblage and the Sacramento-San Joaquin Estuary (i.e., the Delta).

Native fish species that occur where the Sacramento River meets the Delta include Sacramento sucker (*Catostomus occidentalis*), Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento splittail (*Pogonichthys macrolepidotus*), Sacramento blackfish (*Orthodon microlepidotus*), hitch (*Lavinia exilicauda*), Chinook salmon (*Oncorhynchus tshawytscha*) (winter-, spring-, fall-, and late fall–run), steelhead (*O. mykiss*), green sturgeon (*Acipenser medirostris*), white sturgeon (*A. transmontanus*), Pacific lamprey (*Entosphenus tridentata*), river lamprey (*Lampetra ayresi*), delta smelt (*Hypomesus transpacificus*), longfin smelt (*Spirinchus thaleichthys*), tule perch (*Hysterocarpus traski*), and prickly sculpin (*Cottus asper*) (Moyle 2002). The dominant fishes, however, are all nonnative (alien) species: largemouth, smallmouth, and spotted bass (*Micropterus* spp.); white and black crappie (*Pomoxis* spp.); bluegill (*Lepomis macrochirus*); American (*Alosa sapidissima*) and threadfin shad (*Dorosoma petenense*); striped bass (*Morone saxatilis*); bigscale logperch (*Percina macrolepida*); red shiner (*Cyprinella lutrensis*); inland silverside (*Menidia beryllina*); white catfish (*Ameiurus catus*); black and brown bullhead (*Ameiurus* spp.); and common carp (*Cyprinus carpio*) (Moyle 2002).

The Sacramento River is wide and deep and provides unimpeded passage for migratory and resident fish species in the BSA. Although the existing I Street Bridge is supported on three in-water piers, the existing piers do not confine flows or create hydraulic conditions (e.g., shallow water depths or excessive water velocities) that adversely affect the upstream or downstream passage of fish or other aquatic organisms in the Sacramento River.

3.2 Regional Special-Status Species

Regional species and habitats of concern were identified using the CNDDB records search (California Department of Fish and Wildlife 2015) (Appendix B), CNPS's online Inventory of Rare and Endangered Plants of California (2015) (Appendix B), the species list obtained from the USFWS (2015a) website (Appendix B), and species distribution and habitat requirements data. Based on a review of this information, 24 special-status plant species, 26 special-status wildlife species, and 2 special-status fish species (Tables 3-1 and 3-2 [at the end of the chapter]) were identified as having the potential to occur or are known to occur in the project region (i.e., within 10 miles of the BSA).

For the purpose of this NES, special-status species are plants, wildlife, and fish that are legally protected under ESA, CESA, or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants, animals, and fish are those species in any of the categories listed below.

- Species listed or proposed for listing as threatened or endangered under ESA (50 CFR 17.11 [listed animals], 50 CFR 17.12 [listed plants], and various notices in the Federal Register [FR] [proposed species]).
- Species that are candidates for possible future listing as threatened or endangered under ESA (79 FR 72450 December 5, 2014).
- Species listed or proposed for listing by the State of California as threatened or endangered under CESA (14 CCR 670.5).
- Species that meet the definitions of rare or endangered under CEQA (State CEQA Guidelines Section 15380).
- Plants listed as rare under the CNPPA (California Fish and Game Code 1900 et seq.).
- Plants considered by CDFW and CNPS to be "rare, threatened, or endangered in California" (Rare Plant Ranks 1B and 2; California Department of Fish and Wildlife 2015; California Native Plant Society 2015).
- Plants identified by CDFW and CNPS about which more information is needed to determine their status, and plants of limited distribution (Rare Plant Ranks 3 and 4, California Department of Fish and Wildlife 2015, California Native Plant Society 2015), which may be included as sensitive species on the basis of local significance or recent biological information.
- Animal species of special concern to CDFW.
- Animals fully protected in California (CFGC Section 3511 [birds], 4700 [mammals], 5050 [amphibians and reptiles], and 5515 [fish]).

3.2.1 Special-Status Plants

Based on the searches of the CNDDB, the CNPS rare plant inventory, and the USFWS website, 24 special-status plant species were identified as occurring in the vicinity of the BSA (Table 3-1 [at the end of the chapter]). The natural communities in the BSA contain potential habitat for 4 of these 24 species. The other 20 species have habitat or microhabitat requirements (e.g., playas, vernal pools, perennial marsh; alkaline, saline, clay, or serpentine soils) that are not present in the BSA. Additionally, the relatively high level of historical and ongoing disturbance that is present in most of the BSA detracts from the quality of potential habitat for special-status plant species. No special-status plants were observed during 2015 botanical surveys, and none have been previously reported in the BSA (California Department of Fish and Wildlife 2015; California Native Plant Society 2015).

As described in Chapter 2, the surveys coincided with the reported identification periods of all 24 special-status plant species. Although plant surveys were conducted during a drought period, the special-status species with potential habitat in the BSA would all

grow on the Sacramento River banks. The river banks did not experience substantially drier conditions than normal due to the presence of normal river water levels; therefore, the drought conditions would not be expected to affect the growth of special-status plants along the river. All four species with potential habitat in the BSA are perennial, although three are herbaceous (rose-mallow, Mason's lilaeopsis, and Suisun Marsh aster). The habitat for all three of these species would be restricted to the banks of the Sacramento River, and their seed germination and growth would not likely be affected by the drought conditions. Based on the field survey results and the lack of recorded occurrences in the BSA, this NES concludes that no special-status plant species occur in the BSA.

3.2.2 Special-Status Wildlife

Based on a review of the CNDDB search results; the USFWS list of endangered, threatened, and proposed species within the project region; and species' distribution and habitat data, 26 special-status wildlife species were determined to have the potential to occur in the project region (Table 3-2 [at the end of the chapter]). After completion of the field survey, the biologists determined that 19 of the 26 species would not occur in the BSA because the area lacks suitable habitat or is outside the species' known range. An explanation for the absence of each of these species from the BSA is provided in Table 3-2. Suitable habitat is present in the BSA for the remaining seven species listed below. These species are discussed in Chapter 4.

- Valley elderberry longhorn beetle
- Western pond turtle (*Emys marmorata*)
- Swainson's hawk
- White-tailed kite
- Purple martin (*Progne subis*)
- Pallid bat (*Antrozous pallidus*)
- Western red bat

3.2.3 Special-Status Fish

Based on a review of the CNDDB search results; the USFWS and NMFS lists of endangered, threatened, and proposed species within the project region; and species' distribution and habitat data (e.g., Moyle 2002; U.S. Fish and Wildlife Service 2015b), nine special-status fish species were identified as occurring in the project region (Table 3-2 [at the end of the chapter]). These nine species are listed below and are discussed further in Chapter 4.

- Sacramento River winter-run Chinook salmon

- Central Valley spring-run Chinook salmon
- Central Valley fall- and late fall–run Chinook salmon
- Central Valley steelhead
- Southern Distinct Population Segment (DPS) of North American green sturgeon
- Delta smelt
- Longfin smelt
- Sacramento splittail
- River lamprey

In addition, the Sacramento River in the BSA is designated as critical habitat for Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, North American green sturgeon, and delta smelt. The Sacramento River in the BSA is also considered EFH for Pacific salmon (i.e., Chinook salmon).

3.2.4 Other Protected and Managed Biological Resources

3.2.4.1 Migratory Birds

Non-special-status migratory birds, including raptors, have the potential to nest in trees, in shrubs, and on the ground in the BSA. In addition to purple martins (a species of special concern), cliff swallows and white-throated swifts are known to nest on the approach structures within the BSA. Although common migratory bird species are not considered special-status wildlife species, their occupied nests and eggs are protected by CFGC Sections 3503 and 3503.5 and the MBTA.

3.2.4.2 Bats

Several bat species, including Mexican free-tailed bat, big brown bat, Yuma myotis, and Western red bat were detected in the BSA during acoustic surveys conducted on May 5 and June 11, 2015. During the May 5, 2015 bat survey, Mexican free-tailed bats were observed roosting in expansion joints in the existing I Street Bridge approach structures. Other bat species could roost within the expansion joints and in trees and buildings within the BSA, including special-status bats. Bats play important roles in California ecosystems and offer important benefits to humans, including the control of mosquitos and crop-damaging insects and the deposition of nitrogen rich guano under roosts that serves as a natural fertilizer (Western Bat Working Group 2004; Erickson et al. 2002:2). A total of 18 species of bats use bridges in one way or another in California (Erickson et al. 2002:14). Bridges provide important habitat for roosting bats in California considering the amount of riparian habitat lost and the loss of rock outcrops and caves from reservoir development (Erickson et al. 2002: 2).

3.2.4.3 Protected Trees

A list of trees, by species, with a diameter at breast height (dbh) of 6 inches or greater was recorded for the approximate project footprint areas in the BSA (Appendix E). The City of Sacramento Heritage Tree Ordinance protects all trees with a dbh of 32 inches or greater; and native oaks, California buckeye (*Aesculus californica*), western sycamore (*Platanus racemosa*), and all riparian trees with a dbh of 11.5 inches or greater. The City of West Sacramento Tree Preservation Ordinance protects all trees with a dbh of 24 inches or greater and native oaks with a dbh of 16 inches or greater.

Within the proposed project footprint alternatives, a total of 95 trees meet the tree ordinance criteria for the city in which they occur—approximately 22 trees in Sacramento and 73 trees in West Sacramento (Appendix E). The tree species included in this total are Oregon ash, California black walnut, western sycamore, Fremont's cottonwood, valley oak, black willow, arroyo willow, and tree of heaven. The tree of heaven is an invasive species, but meets the heritage tree size criterion.

3.2.4.4 Invasive Species

Invasive plant species include species designated as federal noxious weeds by the USDA, species listed by the CDFA, and invasive plants identified by Cal-IPC. Invasive plants displace native species, change ecosystem processes, alter plant community structure, and lower wildlife habitat quality (California Invasive Plant Council 2006:1). Road, highway, and related construction projects are some of the principal dispersal pathways for invasive plants and their propagules. FHWA requires that state departments of transportation use the state's noxious weed list to identify invasive plant species that could be spread by construction of transportation projects. Accordingly, Table 3-3 lists the invasive plant species identified by the CDFA and Cal-IPC that are known to occur in the BSA (Natural Resources Conservation Service 2003; California Invasive Plant Council 2006, 2007). No plant species designated as federal noxious weeds have been identified in the BSA (Natural Resources Conservation Service 2014b). Invasive plant species occur in ruderal woodland, disturbed/graded areas, and, to a lesser extent, riparian forest.

Table 3-3. Invasive Plant Species Identified in the Biological Study Area

Species	CDFA	Cal-IPC
Tree of heaven (*Ailanthus altissima*)	–	Moderate
Wild oat (*Avena fatua*)	–	Moderate
Black mustard (*Brassica nigra*)	–	Moderate
Ripgut brome (*Bromus diandrus*)	–	Moderate
Soft chess (*Bromus hordeaceus*)	–	Limited
Red brome (*Bromus madritensis* ssp. *rubens*)	–	High
Cheatgrass (*Bromus tectorum*)	–	High
Italian thistle (*Carduus pycnocephalus*)	C	Moderate
Yellow star-thistle (*Centaurea solstitialis*)	C	High
Bindweed (*Convolvulus arvensis*)	C	–
Bermuda grass (*Cynodon dactylon*)	C	Moderate
Red-stemmed filaree (*Erodium cicutarium*)	–	Limited
Rattail fescue (*Festuca myuros*)	–	Moderate
Italian ryegrass (*Festuca perennis*)	–	Moderate
Edible fig (*Ficus carica*)	–	Moderate
Fennel (*Foeniculum vulgare*)	–	High
Cutleaf geranium (*Geranium dissectum*)	–	Limited
English ivy (*Hedera helix*)	–	High
Bristly ox-tongue (*Helminthotheca echioides*)	–	Limited
Foxtail barley (*Hordeum murinum* ssp. *leporinum*)	–	Moderate
Rough cat's-ear (*Hypochaeris radicata*)	–	Moderate
Perennial peppergrass (*Lepidium latifolium*)	B	High
Tree-tobacco (*Nicotiana glauca*)	–	Moderate
Sourgrass (*Oxalis pes-caprae*)	–	Moderate
English plantain (*Plantago lanceolata*)	–	Limited
Rabbitsfoot grass (*Polypogon monspeliensis*)	–	Limited
Wild radish (*Raphanus sativus*)	–	Limited
Black locust (*Robinia pseudoacacia*)	–	Limited
Himalayan blackberry (*Rubus armeniacus*)	–	High
Curly dock (*Rumex crispus*)	–	Limited
Red sesbania (*Sesbania punicea*)	B	High
Milk thistle (*Silybum marianum*)	–	Limited
London rocket (*Sisymbrium irio*)	–	Moderate
Johnson grass (*Sorghum halepense*)	C	–
Smilo grass (*Stipa miliacea*)	–	Limited
Puncturevine (*Tribulus terrestris*)	C	–
Rose clover (*Trifolium hirtum*)	–	Moderate
Periwinkle (*Vinca major*)	–	Moderate

Note: The California Department of Agriculture (CDFA) and California Invasive Plant Council (Cal-IPC) lists assign ratings that reflect the CDFA and Cal-IPC views of the statewide importance of the pest, likelihood that eradication or control efforts would be successful, and present distribution of the pest in the state. These ratings are guidelines that indicate the most appropriate action to take against a pest under general circumstances. The Cal-IPC species list is more inclusive than the CDFA list.

The CDFA categories indicated in the table are defined as follows:

B: Eradication, containment, control or other holding action at the discretion of the county agricultural commissioner.

C: State-endorsed holding action and eradication only when found in a nursery; action to retard spread outside nurseries at the discretion of the county agricultural commissioner.

The Cal-IPC categories indicated in the table are defined as follows:

High: Species with severe ecological impacts, high rates of dispersal and establishment, and usually widely distributed.

Moderate: Species with substantial and apparent ecological impacts, moderate to high rates of dispersal, establishment dependent on disturbance, and limited to widespread distribution.

Limited: Species with minor ecological impacts, low to moderate rates of invasion, limited distribution, and locally persistent and problematic.

Table 3-1. Special-Status Plants Known or with Potential to Occur in the Project Region, or That May Be Affected by the Proposed Project

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR	General Habitat Description	Blooming Period	Habitat Present/ Absent	Rationale
Ferris' milk-vetch (*Astagalus tener* var. *ferrisiae*)	–/–/1B.1	Seasonally wet areas in meadows and seeps, subalkaline flats in valley and foothill grassland; 6–246 feet	April–May	Habitat absent	Grassland habitat only in open areas of ruderal woodland. Riparian wetland is the only seasonally wet habitat and is not suitable. No subalkaline flats present. Nearest recorded occurrence is ~4 miles west of the BSA. Not observed in April or May 2015 surveys.
Alkali milk-vetch (*Astragalus tener* var. *tener*)	–/–/1B.2	Playas, on adobe clay in valley and foothill grassland, vernal pools on alkali soils; below 197 feet	March–June	Habitat absent	Grassland habitat only in open areas of ruderal woodland. No playas, vernal pools or alkali soils present. Nearest recorded occurrence is more than 10 miles away. Not observed in April or May 2015 surveys.
Heartscale (*Atriplex cordulata* var. *cordulata*)	–/–/1B.2	Saline or alkaline soils in chenopod scrub, meadows and seeps, sandy areas in valley and foothill grassland; below 1,230 feet	April–October	Habitat absent	Grassland habitat only in open areas of ruderal woodland. No saline or alkaline soils present. Nearest recorded occurrence is more than 10 miles away. Not observed in April or May 2015 surveys.
Brittlescale (*Atriplex depressa*)	–/–/1B.2	Alkaline or clay soils in chenopod scrub, meadows and seeps, playas, valley and foothill grassland, vernal pools; below 1,050 feet	April–October	Habitat absent	Grassland habitat only in open areas of ruderal woodland. No alkaline or clay soils present. Nearest recorded occurrence is more than 10 miles away. Not observed in April or May 2015 surveys.
San Joaquin saltscale (*Atriplex joaquiniana*)	–/–/1B.2	Alkaline soils in chenopod scrub, meadows and seeps, playas, valley and foothill grassland; below 2,739 feet	April–October	Habitat absent	Grassland habitat only in open areas of ruderal woodland. No alkaline soils present. Nearest recorded occurrence is more than 10 miles away. Not observed in April or May 2015 surveys.

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR	General Habitat Description	Blooming Period	Habitat Present/ Absent	Rationale
Bristly sedge (*Carex comosa*)	–/–/2.1	Coastal prairie, marshes and swamps at lake margins, valley and foothill grassland; below 2,050 feet	May–September	Habitat absent	Grassland habitat only in open areas of ruderal woodland. Riparian wetland is only seasonally wet and is not suitable habitat. Nearest recorded occurrence is more than 10 miles away. Not observed in April or May 2015 surveys.
Palmate-bracted bird's-beak (*Chloropyron palmatum*) [*Cordylanthus palmatus*]	E/E/1B.1	Alkaline grassland, alkali meadow, chenopod scrub; 50–1,670 feet	May–October	Habitat absent	No alkaline grassland habitat or chenopod scrub present. Nearest recorded occurrence is more than 10 miles away. Not observed in April or May 2015 surveys.
Peruvian dodder (*Cuscuta obtusiflora* var. *glandulosa*)	–/–/2.2	Not seen since 1948; freshwater marshes and swamps; 50–920 feet	July–October	Habitat absent	No freshwater marsh habitat present. Riparian wetland is only seasonally wet and is not suitable habitat. Nearest recorded occurrence is more than 10 miles away.
Dwarf downingia (*Downingia pusilla*)	–/–/2.2	Vernal pools and mesic valley and foothill grasslands; below 1,459 feet	March–May	Habitat absent	No vernal pool habitat present. Nearest recorded occurrence is ~7.5 miles north of the BSA. Not observed in April or May 2015 surveys.
Stinkbells (*Fritillaria agrestis*)	–/–/4.2	Chaparral, cismontane woodland, pinyon-juniper woodland, valley and foothill grassland, on clay, sometimes serpentinite substrate; 33–5,101 feet	March–June	Habitat absent	Grassland habitat only in open areas of ruderal woodland. No chaparral or suitable woodland habitat present. No clay or serpentine soils. Nearest recorded occurrence is ~6 miles northeast of the BSA. Not observed in April or May 2015 surveys.
Boggs Lake hedge-hyssop (*Gratiola heterosepala*)	–/E/1B.2	Clay soils in areas of shallow water, lake margins of swamps and marshes, vernal pool margins; 33–7,791 feet	April–August	Habitat absent	No vernal pool habitat or clay soils present. Nearest recorded occurrence is ~8 miles northeast of the BSA. Not observed in April or May 2015 surveys.

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR	General Habitat Description	Blooming Period	Habitat Present/ Absent	Rationale
Rose-mallow (*Hibiscus lasiocarpus* var. *occidentalis*)	–/–/2.2	Freshwater marsh along rivers and sloughs; often in rip-rap on sides of levees; below 394 feet	June–September	Habitat present	Low potential for presence in rip-rap along the Sacramento River. Riparian wetland is only seasonally wet and is not suitable habitat. Nearest recorded occurrence is ~2 miles northwest of the BSA. Not observed in June 2015.
Northern California black walnut (*Juglans hindsii*)	–/–/1B.1	Last two native stands in Napa and Contra Costa Counties; riparian scrub and riparian woodland; below 1,443 feet	April–May	Habitat present	Riparian habitat present with several black walnut trees, but no native stands present. Nearest recorded occurrence along the Sacramento River ~8 miles south of the BSA is extirpated.
Legenere (*Legenere limosa*)	–/–/1B.1	Deep, seasonally wet habitats such as vernal pools, ditches, marsh edges, and river banks; below 2,887 feet	April–June	Habitat absent	No vernal pool habitat present. Nearest recorded occurrence is ~6 miles northeast of the BSA.
Heckard's pepper-grass (*Lepidium latipes* var. *heckardii*)	–/–/1B.2	Alkaline flats in valley and foothill grassland; 32–656 feet	March–May	Habitat absent	Grassland habitat only in open areas of ruderal woodland. No alkaline soils present. Nearest recorded occurrence is more than 10 miles away. Not observed in April or May 2015 surveys.
Mason's lilaeopsis (*Lilaeopsis masonii*)	–/R/1B.1	Freshwater or brackish marsh, riparian scrub; in tidal zone	April–November	Habitat present	Low potential for presence in degraded habitat present on the Sacramento River bank, but not known to occur in this area; flow and boat wakes are likely too great for establishment of this species, and most levee banks have rip-rap to below the water level or trampled sand flats Nearest recorded occurrence is more than 10 miles away. Not observed in April or May 2015 surveys.
Little mousetail (*Myosurus minimus* ssp. *apus*)	–/–/3.1	Alkaline soils in valley and foothill grassland and vernal pools; 66–2,100 feet	March–June	Habitat absent	BSA is lower than species' known elevation range. No alkaline soils or vernal pool habitat present. Nearest recorded occurrence is more than 10 miles away. Not observed in April or May 2015 surveys.

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR	General Habitat Description	Blooming Period	Habitat Present/ Absent	Rationale
Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*)	–/–/1B.1	Mesic areas in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools;16–5,709 feet	April–July	Habitat absent	No suitable mesic grassland or vernal pool habitat present. Nearest recorded occurrence is more than 10 miles away. Not observed in April or May 2015 surveys.
Colusa grass (*Neostapfia colusana*)	T/E/1B.1	Adobe soils of vernal pools; 16–656 feet	May–August	Habitat absent	No vernal pool habitat or adobe soils present. Nearest recorded occurrence is more than 10 miles away. Not observed in April or May 2015 surveys.
Bearded popcorn flower (*Plagiobothrys hystriculus*)	–/–/1B.1	Mesic grassland, vernal pools; 33–900 feet	April-May	Habitat absent	No mesic grassland or vernal pool habitat present. Nearest recorded occurrence is more than 10 miles away. Not observed in April or May 2015 surveys.
Sanford's arrowhead (*Sagittaria sanfordii*)	–/–/1B.2	Freshwater marshes, sloughs, canals, and other slow-moving water habitats; below 2,132 feet	May–October	Habitat absent	No freshwater marsh or slow-moving water habitat present. Riparian wetland is only seasonally wet and is not suitable habitat. Nearest recorded occurrence is ~2 miles east of the BSA. Not observed in April or May 2015 surveys.
Suisun Marsh aster (*Symphotrichum lentum*)	–/–/1B.2	Brackish and freshwater marshes and swamps; below 10 feet	May–November	Habitat present	Low potential for presence in rip-rap along the Sacramento River. Riparian wetland is only seasonally wet and is not suitable habitat. Nearest recorded occurrence is ~5 miles southwest of the BSA. Not observed in April or May 2015 surveys.
Saline clover (*Trifolium hydrophilum*)	–/–/1B.2	Salt marsh, mesic alkaline areas in valley and foothill grasslands, vernal pools, marshes and swamps; below 980 feet	April–June	Habitat absent	No salt marsh, mesic grassland, vernal pool, or marsh habitat present. Riparian wetland is only seasonally wet and is not suitable habitat. No alkaline soils present. Nearest recorded occurrence is more than 10 miles away. Not observed in April or May 2015 surveys.

Common Name *Scientific Name*	Status[a] Federal/State/ CRPR	General Habitat Description	Blooming Period	Habitat Present/ Absent	Rationale
Crampton's tuctoria (*Tuctoria mucronata*)	E/E/1B.1	Mesic areas in valley and foothill grassland, vernal pools; 16–33 feet	April–August	Habitat absent	No mesic grassland or vernal pool habitat present. Nearest recorded occurrence is more than 10 miles away. Not observed in April or May 2015 surveys.

BSA = biological study area

Sources: California Native Plant Society 2015; California Department of Fish and Wildlife 2015.

[a] Status explanations:

Federal

E = Listed as endangered under the federal ESA.
T = Listed as threatened under the federal ESA.
— = No listing status.

State

E = Listed as endangered under CESA.
R = Listed as rare under the CESA. This category is no longer used for newly listed plants, but some plants previously listed as rare retain this designation.
— = No listing status.

CRPR

1B = List 1B species: rare, threatened, or endangered in California and elsewhere.
2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere.
3 = List 3 species: more information is needed about this plant.
4 = List 4 species: limited distribution; species on a watch list
.1 = Seriously endangered in California (over 80% of occurrences threatened—high degree and immediacy of threat).
.2 = Fairly endangered in California (20-80% occurrences threatened).

Note: In March, 2010, California Department of Fish and Game (now CDFW) changed the name of "CNPS List" or "CNPS Ranks" to "California Rare Plant Ranks (CRPR)." This was done to reduce confusion over the fact that CNPS and CDFW jointly manage the Rare Plant Status Review groups (300+ botanical experts from government, academia, non-governmental organizations, and the private sector) and that the rank assignments are the product of a collaborative effort and not solely a CNPS assignment.

Table 3-2. Special-Status Wildlife and Fish Known or with Potential to Occur in the Project Region, or That May Be Affected by the Proposed Project

Common Name *Scientific Name*	Legal Status (Federal/State/Other)	General Habitat Description	Habitat Present/Absent	Rationale
Invertebrates				
Conservancy fairy shrimp *Branchinecta conservatio*	E/-	Typically found in large, turbid vernal pools but known to occur in other types of pools; occurs in scattered locations from Butte and Tehama Counties to Ventura County.	Habitat absent	No suitable vernal pool habitat is present in the BSA.
Vernal pool fairy shrimp *Branchinecta lynchi*	T/–	Found in Central Valley, central and south Coast Ranges from Tehama to Santa Barbara County; isolated populations also in Riverside County; common in vernal pools; also found in sandstone rock outcrop pools.	Habitat absent	No suitable vernal pool habitat is present in the BSA.
Vernal pool tadpole shrimp *Lepidurus packardi*	E/–	Found from Shasta County south to Merced County; occurs in vernal pools and ephemeral stock ponds.	Habitat absent	No suitable vernal pool habitat is present in the BSA.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	T/–	Streamside habitats below 3,000 feet throughout the Central Valley; occurs in riparian and oak savanna habitats with elderberry shrubs; elderberries are the host plant.	Habitat present	Seven elderberry shrubs are present in the BSA. Only one shrub occurs within riparian habitat.
Amphibians				
California tiger salamander *Ambystoma californiense*	T/T	Breeds during the wet season in vernal pools and ponds, with a minimum 10-week inundation period; adults spend most of the year in grassland oak woodland habitat, primarily in small mammal burrows; occurs from Yolo to Kern County in the Central Valley and in the Sierra Nevada foothills from Amador to Tulare County, and from Sonoma to Santa Barbara County on the coast.	Habitat absent	No suitable habitat for the species is present in the BSA, and the BSA is outside the known distribution of the species.

Common Name *Scientific Name*	Legal Status (Federal/State/Other)	General Habitat Description	Habitat Present/Absent	Rationale
California red-legged frog *Rana draytonii*	T/SSC	Found along the coast and coastal mountain ranges of California from Mendocino to San Diego County and in the Sierra Nevada from Butte to Tuolumne County; occurs in permanent and semipermanent aquatic habitats, such as creeks and ponds, with emergent and submergent vegetation; uses upland areas for cover (burrows, logs, rocks, and crevices) and dispersal.	Habitat absent	No suitable habitat for the species is present in the BSA, and the BSA is outside the known distribution of the species.
Reptiles				
Western pond turtle *Emys marmorata*	–/SSC	Occurs throughout California west of the Sierra-Cascade crest; found from sea level to 6,000 feet; does not occur in desert regions except along the Mojave River and its tributaries; occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms.	Habitat present	In the BSA, suitable aquatic habitat is present in the Sacramento River, and potential upland habitat is present in riparian woodland habitat adjacent to the river.
Giant garter snake *Thamnophis gigas*	T/T	Sloughs, canals, low-gradient streams, and freshwater marsh habitats with a prey base of small fish and amphibians; also found in irrigation ditches and rice fields; requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter.	Habitat absent	The Sacramento River is not considered suitable aquatic habitat for the species. No other suitable habitat is present in the BSA.
Birds				
Swainson's hawk *Buteo swainsoni*	–/T	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley; highest nesting densities occur near Davis and Woodland, Yolo County; nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields.	Habitat present	Suitable nest trees occur within and adjacent to the BSA. Species has been documented nesting north and south of the BSA along the Sacramento River.

Common Name *Scientific Name*	Legal Status (Federal/State/Other)	General Habitat Description	Habitat Present/Absent	Rationale
White-tailed kite Elanus leucurus	–/FP	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexico border; low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging.	Habitat present	Suitable nest trees occur within and adjacent to the BSA.
Western snowy plover *Charadrius alexandrines nivosus*	T/SSC	Barren to sparsely vegetated ground at alkaline or saline lakes, reservoirs, ponds, and riverine sand bars; also along sewage, salt-evaporation, and agricultural wastewater ponds.	Habitat absent	The BSA lacks suitable habitat for the species.
Mountain plover *Charadrius montanus*	-/SSC	Occupies open plains or rolling hills with short grasses or very sparse vegetation; nearby bodies of water are not needed; may use newly plowed or sprouting grainfields.	Habitat absent	The BSA lacks suitable habitat for the species.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	T/E	In the west, breeding populations are limited primarily to the Sacramento Valley; nests in large blocks of riparian habitat with dense understory foliage.	Habitat absent	The riparian habitat in the BSA is not typical nesting habitat used by the species because it consists of mostly thin rows of trees along the river with very little understory.
Burrowing owl *Athene cunicularia*	–/SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along south coast; level, open, dry, heavily grazed or low stature grassland or desert vegetation with available burrows.	Habitat absent	The BSA lacks ground squirrel burrows or other structures that could be used by burrowing owl for nesting.

Common Name *Scientific Name*	Legal Status (Federal/State/Other)	General Habitat Description	Habitat Present/Absent	Rationale
Least Bell's vireo *Vireo bellii pusillus*	E/E	Historically nested in riparian habitat throughout the Central Valley, but the majority of the population now occurs in southern California; recently documented nesting on the San Joaquin River west of Modesto; requires dense riparian vegetation for nesting and a dense, stratified canopy for foraging	Habitat absent	The BSA lacks dense riparian vegetation with a stratified canopy.
Purple martin *Progne subis*	-/SSC	Nests in abandoned woodpecker holes in oaks, cottonwoods, and other deciduous trees in a variety of wooded and riparian habitats. Also nests in vertical drainage holes under elevated freeways and highway bridges.	Habitat present	The species is known to nest in ventilation holes underneath the Sacrament side of the I Street Bridge ramp.
Bank swallow *Riparia riparia*	-/T	Nests in bluffs or banks, usually adjacent to water, where the soil consists of sand or sandy loam.	Habitat absent	The Sacramento River within the BSA lacks suitable bank habitat with sandy open soil for nesting. The banks are all covered with rip-rap.
Grasshopper sparrow *Ammodramus svannarum*	-/SSC	Occurs in dry, dense grasslands, especially those with a variety of grasses and tall forbs and scattered shrubs for singing perches. Nests in slight depressions in dense grasslands.	Habitat absent	The BSA lacks dense grasslands.
Song sparrow ("Modesto populations") *Melospiza melodia*	-/SSC	Endemic to the north-central portion of the Central Valley and the Bay-Delta; breeds in emergent marsh and riparian scrub, and in valley oak riparian forests with dense blackberry understory, vegetated irrigation canals, and levees.	Habitat absent	The BSA lacks riparian habitat with a dense understory and lacks emergent marsh.

Common Name *Scientific Name*	Legal Status (Federal/State/Other)	General Habitat Description	Habitat Present/Absent	Rationale
Tricolored blackbird *Agelaius tricolor*	–/E	Permanent resident in the Central Valley from Butte to Kern County; breeds at scattered coastal locations from Marin County south to San Diego County; and at scattered locations in Lake, Sonoma, and Solano Counties; rare nester in Siskiyou, Modoc, and Lassen Counties; nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grainfields; habitat must be large enough to support 50 pairs; probably requires water at or near the nesting colony.	Habitat absent	The BSA lacks suitable nesting and foraging habitat for the species.
Yellow-headed blackbird *Xanthocephalus xanthocephalus*	-/SSC	Nests in freshwater emergent wetlands with dense vegetation and deep water, often along borders of lakes or ponds; forages along moist shorelines and in grasslands and agricultural areas; breeding range includes primarily the Central Valley, northeastern California, and portions of southern California; most individuals migrate south of California in winter.	Habitat absent	The BSA lacks suitable nesting and foraging habitat for the species.

Common Name *Scientific Name*	Legal Status (Federal/State/Other)	General Habitat Description	Habitat Present/Absent	Rationale
Mammals				
Pallid bat *Antrozous pallidus*	–/SSC	Occurs throughout California, primarily at lower and mid-level elevations in a variety of habitats from desert to coniferous forest; most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California and oak woodland, grassland, and desert scrub in southern California. Daytime roosts include rock outcrops, mines, caves, hollow trees, buildings, and bridges.	Habitat present	The I Street and Jibboom Street approach structures in the BSA are known to be used by bats. Trees on both sides of the river within the BSA also provide potential habitat for bats. Buildings within and adjacent to the BSA also provide potential roosting habitat for pallid bats.
Townsend's big-eared bat *Corynorhinus townsendii townsendii*	–/T	Roosts in caves, tunnels, mines, and dark attics of abandoned buildings; very sensitive to disturbances and may abandon a roost after one onsite visit. Also reported to use bridges and hollow trees as roost sites. In bridges, typically uses cavernous spaces under bridges. In California, occurs in inland deserts, moist cool redwood forests, oak woodlands of the inner Coast Ranges and Sierra Nevada foothills, and lower to mid-elevation mixed coniferous forests.	Habitat absent	The species is not currently known to occur on the floor of the Sacramento Valley.
Western red bat *Lasiurus blossevillii*	–/SSC	Found throughout much of California at lower elevations; found primarily in riparian and wooded habitats; occurs at least seasonally in urban areas; day roosts in trees within the foliage; found in fruit orchards and sycamore riparian habitats in the Central Valley.	Habitat present	Trees within the BSA represent potential roosting habitat for the species.

Common Name *Scientific Name*	Legal Status (Federal/State/Other)	General Habitat Description	Habitat Present/Absent	Rationale
Western mastiff bat *Eumops perotis californicus*	-/SSC	Typically roosts in crevices in cliffs and rocky outcrops, in colonies of fewer than 100 individuals; may also roost in caves and buildings that allow sufficient height and clearance for dropping into flight; forages in a variety of grassland, shrub, and wooded habitats, including riparian and urban areas, although most commonly in open, arid lands; year-round range spans most of California, with records absent from the northwest and northeast portions of the state and is not known to occur on the floor of the Sacramento Valley.	Habitat absent	Although areas that could be used for roosting are present in the BSA (buildings), the species is not known to roost on the floor of the Sacramento Valley.
American badger *Taxidea taxus*	-/SSC	Drier open shrub, forest, and herbaceous habitats with friable soils; typically does not occupy cultivated lands; a single individual's home range can range between 300 and 1,500 acres; year-round range spans all of California except the Humboldt and Del Norte County coasts.	Habitat absent	No suitable habitat in the BSA for this species.
Fish				
Sacramento River winter-run Chinook salmon *Oncorhynchus tshawytscha*	E/E	Mainstem Sacramento River below Keswick Dam (Moyle 2002); occurs in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 12.5 °C; habitat types are riffles, runs, and pools (Moyle 2002); adults and juveniles migrate in the lower Sacramento River and through the Delta.	Habitat present	Sacramento River within the BSA provides migration and seasonal rearing habitat, is designated as critical habitat for the species, and is considered essential fish habitat (EFH) for Chinook salmon.

Common Name *Scientific Name*	Legal Status (Federal/State/Other)	General Habitat Description	Habitat Present/Absent	Rationale
Central Valley spring-run Chinook salmon *Oncorhynchus tshawytscha*	T/T	Upper Sacramento River, Feather River, and Yuba River and several perennial tributaries of the Sacramento River (Battle, Butte, Clear, Deer, and Mill Creeks); has the same general habitat requirements as winter-run Chinook salmon; coldwater pools are needed for holding adults (Moyle 2002); adults and juveniles migrate in the lower Sacramento River and through the Delta.	Habitat present	Sacramento River within the BSA provides migration and seasonal rearing habitat, is designated as critical habitat for the species, and is considered EFH for Chinook salmon.
Central Valley fall-/late fall–run Chinook salmon *Oncorhynchus tshawytscha*	SC/SSC	Sacramento and San Joaquin Rivers and tributary Central Valley streams and rivers below impassable barriers; occurs in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 12.5 °C; habitat types are riffles, runs, and pools; adults spawn at head of riffles/tails of pools; young rear for several months and emigrate to the ocean before summer (Moyle 2002).	Habitat present	Sacramento River within the BSA provides migration and seasonal rearing habitat, and is considered EFH for Chinook salmon.
Central Valley steelhead *Oncorhynchus mykiss*	T/–	Sacramento and San Joaquin Rivers and tributary Central Valley streams and rivers below impassable barriers; occurs in well-oxygenated, cool, riverine habitat with water temperatures from 7.8 to 18 °C; habitat types are riffles, runs, and pools; adults spawn at head of riffles/tails of pools; young rear year-round for 1–4 years before emigrating to the ocean (Moyle 2002).	Habitat present	Sacramento River within the BSA provides migration and seasonal rearing habitat, and is designated as critical habitat for the species.

Common Name *Scientific Name*	Legal Status (Federal/State/Other)	General Habitat Description	Habitat Present/Absent	Rationale
Green sturgeon (southern DPS) *Acipenser medirostris*	T/SSC	Sacramento, Klamath, and Trinity Rivers (Moyle 2002). Spawns in large river systems with well-oxygenated water, with temperatures from 8.0 to 14 °C.	Habitat present	Sacramento River within the BSA provides migration and rearing habitat, and is designated as critical habitat for the species.
Delta smelt *Hypomesus transpacificus*	T/E	Found primarily in the Sacramento–San Joaquin Estuary but has been found as far upstream as the mouth of the American River on the Sacramento River and Mossdale on the San Joaquin River; range extends downstream to San Pablo Bay; occurs in estuary habitat in the Delta where fresh and brackish water mix in the salinity range of 2–7 parts per thousand (Moyle 2002).	Habitat present	Sacramento River within the BSA provides migration, spawning, and seasonal rearing habitat and is designated as critical habitat for the species.
Longfin smelt *Spirinchus thaleichthys*	-/T	San Francisco estuary, Humboldt Bay, Eel River estuary, and Klamath River estuary. Occurs in open waters of estuaries and seasonally migrates to spawn in freshwater habitats of upper estuary; spawns over sand, rocks, and aquatic plants.	Habitat present	Sacramento River within the BSA provides migration, spawning, and seasonal rearing habitat.
Sacramento splittail *Pogonichthys macrolepidotus*	–/SSC	Occurs throughout the year in low-salinity waters and freshwater areas of the Sacramento–San Joaquin Delta, Yolo Bypass, Suisun Marsh, Napa River, and Petaluma River (Moyle 2002). Spawning takes place among submerged and flooded vegetation in sloughs and the lower reaches of rivers.	Habitat present	Sacramento River within the BSA provides migration, spawning, and seasonal rearing habitat.

Common Name *Scientific Name*	Legal Status (Federal/State/Other)	General Habitat Description	Habitat Present/Absent	Rationale
River lamprey *Lampetra ayresi*	–/SSC	Sacramento, San Joaquin, and Napa Rivers; tributaries of San Francisco Bay (Moyle 2002; Moyle et al. 1995). Adults live in the ocean and migrate into fresh water to spawn.	Habitat present	Sacramento River within the BSA provides migration and rearing habitat.

[a] Status explanations:

Federal

E = Listed as endangered under the federal Endangered Species Act.
T = Listed as threatened under the federal Endangered Species Act.
D = Delisted from the federal Endangered Species Act.
– = No listing.

State

E = Listed as endangered under the California Endangered Species Act.
T = Listed as threatened under the California Endangered Species Act.
P = Proposed for listing as threatened or endangered under the California Endangered Species Act.
FP = Fully protected under the California Fish and Game Code.
SSC = Species of special concern in California.
– = No listing.

Notes: Habitat absent – no habitat present and no further work needed. Habitat present –habitat is, or may be, present. The species may be present.

Chapter 4 Results: Biological Resources, Discussion of Impacts and Mitigation

The impact analysis for biological resources was conducted by evaluating the potential changes to existing biological communities based on the anticipated project construction activities and permanent project elements that could cause impacts of varying degrees on sensitive biological resources present in the BSA.

There are two roadway design alternatives for the Railyards Boulevard/Jibboom Street/Bercut Drive intersection in the City of Sacramento, but both alternatives would have the same impact area on biological resources. Therefore, the impacts of these alternatives are not discussed separately in this chapter. In some instances, impacts of the two City of West Sacramento residential access alternatives on biological resources would differ from each other. These differences are described in the analyses below. Figure 3-1 shows the locations of each land cover type and proposed project impacts. Table 4-1 lists the acreages of each land cover type within the portions of the BSA that would be permanently or temporarily affected by the proposed project.

Table 4-1. Permanent and Temporary Impacts on Land Cover Types in the Biological Study Area[a]

	Proposed Project with West Sacramento Residential Access Alternative 1[a]		Proposed Project with West Sacramento Residential Access Alternative 2[a]	
Land Cover Type	**Permanent Impact Area (acres)**	**Temporary Impact Area (acres)**	**Permanent Impact Area (acres)**	**Temporary Impact Area (acres)**
Cottonwood riparian forest[b]	2.54	1.79	1.44	1.52
Riparian forest/shrub wetland[b]	0.07	0.11	0	0
Perennial drainage[b]	1.85	0.10	1.85	0.10
Ruderal woodland	2.00	1.70	2.00	1.70
Landscaped	0.60	0.70	0.54	0.63
Developed/graded	7.91	5.87	7.74	5.69
Total	**15.23**	**10.27**	**13.55**	**9.64**

[a] There are no differences in acreage impacts as a result of the City of Sacramento roadway design alternatives.
[b] These are natural communities of special concern.

4.1 Natural Communities of Special Concern

The BSA supports three natural communities of special concern: cottonwood riparian forest, riparian forest/shrub wetland, and perennial stream.

4.1.1 Cottonwood Riparian Forest

4.1.1.1 Survey Results

Riparian forest in the BSA occurs along the upper banks and floodplains of the Sacramento River. The overstory of riparian forest is predominantly mature Fremont cottonwood trees associated with valley oak and black walnut. Other riparian tree species observed include Oregon ash, boxelder, and black willow. The riparian understory on the waterside of the levee is primarily rip-rap with non-native annual grasses and forbs; however, there are also patches of more typical riparian species, such as narrow-leaf willow, Himalayan blackberry, and mugwort. Local, state, and federal agencies recognize riparian habitats as sensitive natural communities.

4.1.1.2 Project Impacts

Implementation of the proposed project would result in a loss of cottonwood riparian habitat. Clearing of the existing cottonwood riparian forest vegetation within the proposed project footprint would result from construction activities related to the abutments for the two fixed-span bridge approach structures on both the City of Sacramento and City of West Sacramento sides, residential access in West Sacramento, temporary access roads, and roadway approaches (Figure 3-1). Impacts on cottonwood riparian forest differ between the two proposed residential access alternatives in the City of West Sacramento (Table 4-1).

Construction of the proposed project with City of West Sacramento Residential Access Alternative 1 would result in permanent loss of up to 2.54 acres of cottonwood riparian forest within the area designated as the limits of disturbance. Clearing of the existing cottonwood riparian forest vegetation within the proposed project footprint would result from activities related to construction of two fixed-span bridge approach structures, the bikeway along Jibboom Street in the City of Sacramento, the new residential access road connecting B Street and C Street, and recontouring the slope on the north side of the road in the City of West Sacramento (Figure 3-1). The riparian area between the permanent footprint of the bridge abutments and the bikeway on the City of Sacramento side or the road on the City of West Sacramento side would be considered permanently removed. In this area, vegetation would be removed during construction of the adjacent structures and overhead bridge and would be unlikely to revegetate after construction due to low clearance under the bridge and shading from the bridge. Up to 1.79 acres of riparian forest would temporarily be disturbed during construction of the proposed project with City of West Sacramento Residential Access Alternative 1. Temporary impacts would occur from trimming riparian vegetation and removing additional trees and understory vegetation to provide equipment access.

Construction of the proposed project with City of West Sacramento Residential Access Alternative 2 would result in permanent loss of up to 1.44 acres of cottonwood riparian forest

within the area designated as the limits of disturbance. Clearing of the existing cottonwood riparian forest vegetation within the proposed project footprint would result from construction activities related to construction of two fixed-span bridge approach structures, the bikeway along Jibboom Street in the City of Sacramento, and the new residential access road connecting B Street and 3rd Street in the City of West Sacramento (Figure 3-1). As described for Alternative 1, the riparian area between the permanent footprint of the bridge abutments and the bikeway on the City of Sacramento side or the road on the City of West Sacramento side also would be considered permanently removed. Temporary disturbance of up to 1.52 acres of riparian forest would occur during construction of the proposed project with City of West Sacramento Residential Access Alternative 2. Temporary impacts would occur from trimming riparian vegetation and removing additional trees and understory vegetation to provide equipment access.

The proposed project could result in indirect impacts on riparian habitat from shading of habitat by the new bridge approach structures on both river banks. The extent of potential shading effects on areas north and south of the bridge depends on the width and height of the new approach structures above the existing vegetation and the orientation of the structures relative to the sun's path. During part of the year, the north side of the new structures would be more shaded than the south side. However, the height of the proposed structures would allow adequate light to penetrate most of the adjacent vegetation during much of the year and would be unlikely to cause a loss of, or a shift in, the species composition of riparian vegetation adjacent to the new structures. Further discussion of potential shading impacts and loss of shaded riverine aquatic (SRA) cover habitat is provided in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

State and federal agencies would require avoidance, minimization, and compensatory mitigation for the loss of riparian habitat. CDFW will require an LSAA for construction within the riparian habitat.

4.1.1.3 Avoidance and Minimization Efforts

Implementation of Measures 1–3 would ensure that the proposed project minimizes effects on cottonwood riparian forest adjacent to the project construction area.

Measure 1: Install Orange Construction Fencing between the Construction Area and Adjacent Sensitive Biological Resources

The project proponent and/or their contractor will install orange construction fencing between the construction area and adjacent sensitive biological resource areas. Sensitive biological resources that occur adjacent to the construction area that could be directly affected by the project include natural communities of special concern; special-status

wildlife habitats for valley elderberry longhorn beetle; nest sites of Swainson's hawk, purple martin, or other migratory birds; roosting bats; and protected trees to be avoided.

Barrier fencing around sensitive areas will be installed as one of the first orders of work and prior to equipment staging. Before construction begins, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the orange construction fencing, and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as environmentally sensitive areas and clearly identified on the construction plans and described in the specifications. To minimize the potential for snakes and other ground-dwelling animals from being caught in the orange construction fencing, the fencing will be placed with at least a 1-foot gap between the ground and the bottom of the orange construction fencing. The exception to this condition is where construction barrier fencing overlaps with erosion control fencing and must be secured to prevent sediment runoff. Barrier fencing will be installed before construction activities are initiated, maintained throughout the construction period, and removed after completion of construction.

Measure 2: Conduct Environmental Awareness Training for Construction Employees

The project proponent will retain a qualified biologist to conduct environmental awareness training for construction crews before project implementation. The awareness training will be provided to all construction personnel and will brief them on the need to avoid effects on sensitive biological resources (e.g., native trees, natural communities of special concern, and special-status species habitats in and adjacent to the construction area). The education program will include a brief review of the special-status species with the potential to occur in the BSA (including their life history, habitat requirements, and photographs of the species). The training will identify the portions of the BSA in which the species may occur, as well as their legal status and protection. The program also will cover the restrictions and guidelines that must be followed by all construction personnel to reduce or avoid effects on these species during project implementation. This will include the steps to be taken if a sensitive species is found within the construction area (i.e., notifying the crew foreman, who will call a designated biologist). In addition, construction employees will be educated about the importance of controlling and preventing the spread of invasive plant infestations. An environmental awareness handout that describes and illustrates sensitive resources to be avoided during project construction and identifies all relevant permit conditions will be provided to each crew member. The crew foreman will be responsible for ensuring that crew members adhere to the guidelines and restrictions. Education programs will be conducted for appropriate new personnel as they are brought on the job during the construction period.

Measure 3: Conduct Periodic Biological Monitoring

The project proponent will retain a qualified biological monitor for the project who will visit the site a minimum of once per week to ensure that fencing around environmentally sensitive areas is intact and that activities are being conducted in accordance with the

agreed upon project schedule and agency conditions of approval. The monitor will provide the project proponent with a monitoring log for each site visit.

Certain activities will require a biological monitor to be present for the duration of the activity or during the initial disturbance of an area to ensure that impacts on special-status species are avoided. The activities that require specific monitoring are identified below in Measures 10, 13, 25, and 26.

4.1.1.4 Compensatory Mitigation

Implementation of Measure 4 would compensate for temporary effects to and permanent loss of riparian forest habitat.

Measure 4: Compensate for Temporary Effects to and Permanent Loss of Cottonwood Riparian Forest (including SRA Cover)

The project proponent will compensate for the permanent loss of up to 2.54 acres of riparian forest under City of West Sacramento Residential Access Alternative 1 or up to 1.44 acres of riparian forest under City of West Sacramento Residential Access Alternative 2. In addition, any unavoidable temporary loss of riparian forest will be mitigated. The project proponent will implement onsite and, if necessary, offsite compensation measures and/or purchase mitigation bank credits to compensate for losses of cottonwood riparian forest on the waterside slope of the existing levees, including riparian forest supporting SRA cover habitat (as described in section 4.4.1.4, "Survey Results", portions of the cottonwood riparian forest in the BSA also provide SRA cover habitat for fish). Onsite compensation will be used to the maximum extent practicable. Compliance with the USACE levee vegetation policy (U.S. Army Corps of Engineers 2014), the ULDC (California Department of Water Resources 2012b), or other engineering constraints may limit the ability to achieve full onsite compensation. Therefore, offsite compensation and/or purchase of mitigation bank credits may be needed to achieve no net loss of existing in-kind riparian and SRA cover habitat values. Each of these options is discussed below.

1. **Onsite and/or Offsite Restoration and/or Enhancement along the Sacramento River.** Riparian habitat restoration and/or enhancement onsite or offsite should occur in the same year construction is completed. For onsite or offsite replacement plantings, the project proponent will prepare a mitigation planting plan, including a species list and number of each species, planting locations, and maintenance requirements. Plantings will consist of cuttings taken from local plants or plants grown from local material. Planted species for the mitigation plantings will be similar to those removed from the project area and will include native species, such as Fremont cottonwood, valley oak, black walnut, Oregon ash, boxelder, and black willow. The final planting plan will be developed based on results of the arborist survey for species to be removed (see additional discussion below). All plantings will be fitted with exclusion cages or other suitable protection from herbivory. Plantings will be irrigated for up to 3 years or until established. Plantings will be monitored annually for 3 years or as required in the project permits. If 75% of the plants survive

at the end of the monitoring period, the re-vegetation will be considered successful. If the survival criterion is not met at the end of the monitoring period, planting and monitoring will be repeated after mortality causes have been identified and corrected.

2. **Mitigation Bank Credit Purchase.** If this option is chosen, the project proponent will provide written evidence to the resource agencies that compensation has been established through the purchase of mitigation credits. The amount to be paid will be the fee that is in effect at the time the fee is paid. The mitigation will be approved by CDFW and may be modified during the permitting process. Mitigation can be in the form of creation and/or preservation credits. If mitigation is in the form of restoration/creation credits, the mitigation will be at a minimum ratio of 1:1 (1 acre of restored or created riparian habitat for each acre of riparian habitat removed). If mitigation is in the form of preservation credits, the mitigation will be at a minimum ratio of 2:1 (2 acres of preserved riparian habitat for each acre of riparian habitat removed). The final compensation ratio will be approved by CDFW in order to result in no net loss of riparian habitat. The project proponent will purchase riparian habitat credits from an approved mitigation bank near the project, such as the Cosumnes Floodplain Mitigation Bank, Fremont Landing Conservation Bank, or Elsie Gridley Mitigation Bank. Replacement riparian forest habitat will include trees species that would support nesting Swainson's hawk (i.e., oak, cottonwood) and will occur within the range of nesting Swainson's hawk within the Sacramento Valley.

To provide a more accurate estimate of tree loss, an arborist survey will be conducted upon completion of 90% design plans for the project. In addition to a description of the tree, the arborist survey report will include the precise location of the trunk and size of the dripline for all trees whose trunk or canopy overlap with the project footprint. Riparian forest compensation will be consistent with the requirements of the City of West Sacramento and City of Sacramento tree ordinances to ensure compensation for losses of individual protected trees.

In addition to mitigating for the loss of riparian forest habitat, specific measures will be included to satisfy NMFS requirements and compensate for the loss of SRA cover (area and linear feet). However, the acreage will not be duplicated, such that the acreage of riparian forest habitat restored for SRA cover mitigation will apply towards riparian forest habitat mitigation requirements. SRA cover mitigation will include the following riparian replacement requirements:

- Replace the 890 linear feet and 0.44 acres of affected SRA cover vegetation (see section 4.4.1.5, "Loss of Shaded Riverine Aquatic Cover") at a 3:1 replacement ratio (i.e., 3 linear feet replaced for every 1 foot affected and 3 acres replaced for every acre affected) by planting native riparian trees in temporary impact areas and along existing onsite or offsite unshaded banks along the Sacramento River.
- Plant native riparian trees onsite to the maximum extent practicable, followed by planting on adjacent reaches of the Sacramento River to minimize the need for purchasing offsite mitigation bank credits.
- Plant riparian trees that are intended to provide SRA cover along the water's edge at summer low flows up to the OHWM and at sufficient densities to provide shade along

at least 85% of the bank's length when the trees reach maturity. This will ensure that riparian plantings intended for SRA cover mitigation will contribute to instream SRA cover when they are inundated during winter/spring flows and overhead cover (shade) during summer flows when they approach maturity.

- Monitor and evaluate the re-vegetation success of riparian plantings intended for SRA cover mitigation as described above.

If mitigation for SRA cover is in the form of offsite mitigation bank credits, credits will need to be purchased from an approved mitigation bank within the approved service area for the project that provides riparian forest floodplain conservation credits as off-site compensation for impacts on state- and federally-listed fish species, designated critical habitat, and EFH for Pacific salmon.

4.1.1.5 Cumulative Impacts

Cumulative impacts on riparian forest would result from construction of other general development and levee projects in Sacramento and Yolo Counties. Although implementation of the avoidance and minimization efforts and compensatory mitigation would replace the lost habitat, the compensation would occur offsite and not on the Sacramento River, in compliance with the Urban Levee Design Criteria regarding woody vegetation on flood protection levees (California Department of Water Resources 2012b). The loss of riparian forest on the Sacramento River, therefore, would be permanent and would contribute to the ongoing loss of riparian habitat along the river. Therefore, construction of the proposed project would make a considerable contribution to the cumulative loss of riparian forest.

4.1.2 Riparian Forest/Shrub Wetland

4.1.2.1 Survey Results

Riparian forest/shrub wetland in the BSA occurs in one wetland within riparian habitat that meets all three federal wetland criteria (i.e., hydrophytic vegetation, hydric soils, and wetland hydrology). The riparian forest/shrub wetland is located in the northern portion of the BSA, on the west side of the Sacramento River within a basin. The vegetative composition of riparian forest/shrub wetlands is predominantly cottonwood but also includes buttonwillow, boxelder, and narrow-leaf willow. Local, state, and federal agencies recognize riparian and wetland habitats as sensitive natural communities.

4.1.2.2 Project Impacts

Construction of the proposed project with City of West Sacramento Residential Access Alternative 1 would result in the loss of riparian forest/shrub wetland. Clearing of the existing riparian forest/shrub wetland vegetation within the proposed project footprint would result from construction activities related to the proposed connecting road between B Street and C Street and

recontouring the slope on the north side of the road (Figure 3-1). These construction activities would result in a permanent loss of approximately 0.07 acre of riparian wetland, pending verification of the wetland extent by USACE (Table 4-1). No impact on riparian forest/shrub wetland would result from constructing the proposed project with City of West Sacramento Residential Access Alternative 2.

Temporary disturbance of up to 0.11 acre of riparian wetland would occur during construction and likely would include trimming riparian vegetation and removing additional trees and understory vegetation to provide equipment access.

State and federal agencies would require avoidance, minimization, and compensatory mitigation for the loss of riparian wetland habitat. The loss or disturbance of riparian wetland vegetation is considered adverse because it provides a variety of important ecological functions and values.

4.1.2.3 Avoidance and Minimization Efforts

Implementation of Measures 1–3 and 5 would ensure that the proposed project minimizes effects to riparian forest/shrub wetland habitat adjacent to the project construction area.

Measure 5: Protect Water Quality and Prevent Erosion and Sedimentation in Drainages and Wetlands

The project proponent and/or their construction contractor will comply with all construction site BMPs specified in the Water Quality Assessment Report prepared for the project (ICF 2015) and the final SWPPP that will be developed for the project, as well as any other permit conditions to minimize introduction of construction-related contaminants and mobilization of sediment in the Sacramento River and the riparian forest/shrub wetland. Broadly, these BMPs will address soil stabilization, sediment control, wind erosion control, vehicle tracking control, non-storm water management, and waste management practices. The BMPs will be based on the best conventional and best available technology.

The proposed project is subject to storm water quality regulations established under the NPDES, described in Section 402 of the federal CWA. In California, the NPDES program requires that any construction activity disturbing 1 or more acres comply with the statewide General Permit, as authorized by the State Water Board. The General Permit requires elimination or minimization of non-storm water discharges from construction sites and development and implementation of a SWPPP for the site. The primary elements of the SWPPP include the following.

- Description of site characteristics—including runoff and streamflow characteristics and soil erosion hazard—and construction procedures
- Guidelines for proper application of erosion and sediment control BMPs
- Description of measures to prevent and control toxic materials spills

- Description of construction site housekeeping practices

In addition to these primary elements, the SWPPP specifies that the extent of soil and vegetative disturbance would be minimized by control fencing or other means and that the extent of soil disturbed at any given time would be minimized. The SWPPP must be retained at the construction site.

The BMPs will be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable; they are subject to review and approval by the project proponent. The project proponent will perform routine inspections of the construction area to verify that the BMPs are properly implemented and maintained. The project proponent will notify contractors immediately of a noncompliance issue and will require compliance.

The BMPs will include, but are not limited to, the following.

- All earthwork or foundation activities involving wetlands or the intermittent vegetated stream will occur in the dry season (between May 1 and October 31). All in-water work within the Sacramento River will be conducted between May 1 and November 30 to minimize or avoid potential impacts on sensitive life stages (migration, spawning, egg and embryo incubation, and rearing) of special-status fish species.
- Equipment used in and around drainages and wetlands will be in good working order and free of dripping or leaking engine fluids. All vehicle maintenance will be performed at least 300 feet from all streams. Any necessary equipment washing will be carried out where the water cannot flow into drainages or wetlands.
- Develop a hazardous material spill prevention control and countermeasure plan before construction begins. The plan will include strict onsite handling rules to keep construction and maintenance materials from entering the river, including procedures related to refueling, operating, storing, and staging construction equipment and to preventing and responding to spills. The plan also will identify the parties responsible for monitoring a spill response. During construction, any spills will be cleaned up immediately according to the spill prevention control and countermeasure plan. The project proponent will review and approve the contractors' spill prevention control and countermeasure plan before allowing construction to begin.
- Prohibit the following types of materials from being rinsed or washed into the streets, shoulder areas, or gutters: concrete, solvents and adhesives, thinners, paints, fuels, sawdust, dirt, gasoline, asphalt and concrete saw slurry, and heavily chlorinated water.
- Take any surplus concrete rubble, asphalt, or other rubble from construction to a local landfill.
- Prepare and implement an erosion and sediment control plan for the proposed project that will include the following provisions and protocols. The SWPPP for the project will detail the applications and type of measures and the allowable exposure of unprotected soils.

- Discharge from dewatering operations, if needed, and runoff from disturbed areas will be made to conform to the water quality requirements of the waste discharge permit issued by the RWQCB.
- Apply temporary erosion control measures, such as sandbagged silt fences, throughout construction of the proposed project and remove them after the working area is stabilized or as directed by the engineer. Soil exposure will be minimized through use of temporary BMPs, groundcover, and stabilization measures. Exposed dust-producing surfaces will be sprinkled daily, if necessary, until wet; this measure will be controlled to avoid producing runoff. Paved roads will be swept daily following construction activities.
- The contractor will conduct periodic maintenance of erosion and sediment control measures.
- Plant an appropriate seed mix of native species on disturbed areas upon completion of construction.
- Cover or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more) that could contribute sediment to waterways.
- Enclose and cover exposed stockpiles of dirt or other loose, granular construction materials that could contribute sediment to waterways. Material stockpiles will be located in non-traffic areas only. Side slopes will not be steeper than 2:1. All stockpile areas will be surrounded by a filter fabric fence and interceptor dike.
- Contain soil and filter runoff from disturbed areas by berms, vegetated filters, silt fencing, straw wattle, plastic sheeting, catch basins, or other means necessary to prevent the escape of sediment from the disturbed area.
- Use other temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) to control erosion from disturbed areas as necessary.
- Avoid earth or organic material from being deposited or placed where it may be directly carried into the channel.

The project proponent also will obtain a 401 Water Quality Certification from the Central Valley RWQCB, which may contain additional BMPs and water quality measures to ensure the protection of water quality.

4.1.2.4 Compensatory Mitigation

Implementation of Measure 6 would compensate for temporary and permanent loss of riparian forest/shrub wetland habitat.

Measure 6: Compensate for Permanent Loss of Riparian Forest/Shrub Wetland

The project proponent will comply with any regulatory requirements determined as part of the CWA Section 404 permit for the work that would occur within the riparian

forest/shrub wetland, including wetland mitigation. The project proponent will compensate for the permanent loss of up to 0.07 acre of riparian forest/shrub wetland under City of West Sacramento Residential Access Alternative 1. The actual affected acreage is pending verification by USACE.

The project proponent will compensate for the loss of up to 0.07 acre of riparian forest/shrub wetland by purchasing mitigation bank credits, which can be in the form of preservation and/or creation credits:

- The mitigation ratio will be a minimum of 2:1 (2 acres of mitigation for each acre of riparian wetland filled), for a total of up to 0.14 acre, if credits are for preservation of riparian wetland habitat, or
- a minimum of 1:1 (1 acre of mitigation for each acre of riparian wetland removed), for a total of up to 0.07 acre, if credits are for creation of riparian wetland habitat.

Final ratios will be as required under the Section 404 permit in order to result in no net loss of wetland habitat. The project proponent will purchase riparian wetland credits from an approved mitigation bank near the project, such as the Cosumnes Floodplain Mitigation Bank or Elsie Gridley Mitigation Bank. If no suitable mitigation bank options are available at the time of construction, the project proponent will pay into the National Fish and Wildlife Foundation Sacramento District In-Lieu Fee (ILF) program.

4.1.2.5 Cumulative Impacts

Cumulative impacts on riparian forest/shrub wetland would result from construction of other general development projects in Sacramento and Yolo Counties. With implementation of the avoidance and minimization efforts and compensatory mitigation, construction of the proposed project would not add to the cumulative loss of riparian forest/shrub wetland and would not result in a cumulatively adverse effect on riparian forest/shrub wetland.

4.1.3 Perennial Stream

4.1.3.1 Survey Results

The Sacramento River is the only perennial stream in the BSA (see Figure 3-1). All perennial stream is unvegetated open water. The river averages 672 feet wide at the OHWM in the BSA. The river banks are levees that are mostly steeply sloped and support riparian forest vegetation, as described above, with rip-rap near the bottom of the slope. The Sacramento River is a TNW and a water of the United States subject to regulation under CWA Section 404 and Section 10 of the RHA, and under the jurisdiction of USACE. The river is considered a sensitive natural community. The RWQCB protects all waters of the State under the Porter-Cologne Act.

4.1.3.2 Project Impacts

Implementation of the proposed project would result in temporary and permanent impacts (placement of fill) on the Sacramento River in the BSA, including construction of bridge

approach structures and installation of RSP around bridge abutments and piers, RSP along the shoreline adjacent to the bridge, a bridge fender system, and temporary cofferdams (Figures 1-3 and 3-1). In addition to direct fill impacts, project activities could indirectly affect water quality within the stream by causing increased erosion and sedimentation downstream of the work area. The extent of impacts on perennial stream would be the same under all project alternatives.

The abutments for each of the two fixed-span approach structures would be constructed on a foundation above the OHWM. A total of up to 1.85 acre of permanent impacts on perennial stream in the Sacramento River would result from the following bridge components and RSP to be placed below the OHWM (see Table 4-9 below).

- The two fixed-span approach structures for the new bridge would be constructed on center piers (Piers 2 and 5) with foundations each consisting of 50 driven or CIDH piles. The piles would be covered by pile caps and RSP. The footprint for Piers 2 and 5 on the river bottom would total 8,500 square feet (0.20 acre).
- The movable span section of the bridge would be constructed on a foundation of four 9-foot diameter cast-in-steel-shell (CISS) piles in the river bed. The CISS piles, consisting of hollow steel shells, would be driven into the channel bottom using drivers and cranes on the temporary trestle or mounted on barges to temporarily place the steel shells at the desired location for each pile. Once the steel shells are in place, the soil inside the shell would be drilled out, and concrete would be poured into the dewatered hollow shells. The piles would be covered by pile caps and RSP. The footprint for r Piers 3 and 4 on the river bottom would total 1,864 square feet (0.04 acre).
- A bridge fender system would be constructed around the movable span piers that would include approximately 30 driven piles around each pier. The footprint of the bridge fender system on the river bottom would total 85 square feet (0.002 acre).
- RSP (1/4-ton, Method B) would be installed along 1,600 linear feet of shoreline (900 linear feet on City of Sacramento shoreline and 700 linear feet on City of West Sacramento shoreline) below the OHWM. The footprint for the RSP would total up to 70,000 square feet (1.61 acre).

Temporary impacts of up to 0.10 acre would occur due to installation of two cofferdams (approximately 0.09 acre) and approximately 141 temporary trestle piles (0.005 acre) during construction (see Table 4-9 below). A total of 160 trestle piles would be installed, but some of them would be above the OHWM. The area inside the cofferdams would be dewatered by pumping to the river, with implementation of sediment control measures if necessary.

State and federal agencies would require avoidance, minimization, and compensatory mitigation for the loss of perennial stream. The loss of perennial stream is considered adverse because it provides a variety of important ecological functions and values.

4.1.3.3 Avoidance and Minimization Efforts

Implementation of Measures 1–3 and 5 would ensure that the proposed project minimizes effects on perennial stream adjacent to the project construction area.

4.1.3.4 Compensatory Mitigation

Implementation of Measure 7 would compensate for the permanent loss of perennial stream.

Measure 7: Compensate for Loss of Perennial Stream

The project proponent will comply with any regulatory requirements determined as part of the state (Section 401 Water Quality Certification or WDRs, LSAA) and federal (Section 404 and Section 10 permits) processes for the work that would occur in the Sacramento River. The project proponent will compensate for the permanent fill of up to 1.85 acre of other waters of the United States in the Sacramento River by purchasing mitigation bank credits, which can be in the form of preservation and/or creation credits using the following minimum ratios.

- A minimum of 2:1 (2 acres of mitigation for each acre filled), for a total of up to 3.7 acres, if credits are for preservation of habitat; or,
- A minimum of 1:1 (1 acre of mitigation for each acre filled), for a total of up to 1.85 acre, if credits are for creation of habitat.

The actual compensation ratios will be determined through coordination with the Central Valley RWQCB and USACE as part of the permitting process. The project proponent will compensate for permanent loss of perennial stream by implementing one or a combination of the following options.

- Purchase credits for created riparian stream channel at a USACE- approved mitigation bank with a service area that encompasses the project area, such as the Cosumnes Floodplain Mitigation Bank, Fremont Landing Conservation Bank, or Elsie Gridley Mitigation Bank. The project proponent will provide written evidence to the resource agencies that compensation has been established through the purchase of mitigation credits.
- Compensate out-of-kind for loss of perennial stream by implementing compensatory mitigation for cottonwood riparian forest impacts described in Measure 4. The acreage restored or created to compensate for loss of perennial stream will be added to the acreage restored or created for loss of riparian habitat.

4.1.3.5 Cumulative Impacts

Cumulative impacts on perennial stream would result from construction of other general development projects in Sacramento and Yolo Counties. With implementation of the avoidance

and minimization efforts and compensatory mitigation, construction of the proposed project would not add to the cumulative loss of perennial stream and would not result in a cumulatively adverse effect on perennial stream.

4.2 Special-Status Plant Species

4.2.1.1 Survey Results

Based on the searches of the CNDDB, the CNPS rare plant inventory, and the USFWS website, 24 special-status plant species were identified as occurring in the vicinity of the BSA (Table 3-3). The natural communities in the BSA contain potential habitat for 4 of these 24 species, but the relatively high level of historical and ongoing disturbance that is present in most of the BSA detracts from the quality of potential habitat for special-status plant species. No special-status plants were observed during 2015 botanical surveys, and none have been previously reported in the BSA (California Department of Fish and Wildlife 2015; California Native Plant Society 2015).

As mentioned in Chapter 2, the surveys coincided with the reported identification periods of all 24 special-status plant species, although 2015 was a severe drought rain year, which could affect the potential for observation of annual and herbaceous perennial species. All four species with potential habitat in the BSA are perennial, although three are herbaceous and potentially more sensitive to drought conditions (rose-mallow, Mason's lilaeopsis, and Suisun Marsh aster). However, the habitat for all three of these species would be restricted to the banks of the Sacramento River, and their seed germination and growth would not likely be affected by the drought conditions. Based on the field survey results and the lack of recorded occurrences in the BSA, this NES concludes that no special-status plant species occur in the BSA.

4.2.1.2 Project Impacts

No special-status plants were found during botanical surveys of the BSA; therefore, construction of the project with either residential access alternative is not expected to cause any direct or indirect impacts on special-status plants.

4.2.1.3 Avoidance and Minimization Efforts

No avoidance or minimization efforts for impacts on special-status plants are required.

4.2.1.4 Compensatory Mitigation

No compensatory mitigation for impacts on special-status plants is required.

4.2.1.5 Cumulative Impacts

No direct impacts on special-status plants would result from construction of the project; therefore, the project would not contribute to cumulative impacts on special-status plants.

4.3 Special-Status Wildlife Species

Seven special-status wildlife species were identified with the potential to occur in the BSA based on the known range of these species and the suitability of the habitat in the BSA. None of these species, or signs of their presence, were observed in the BSA during surveys.

4.3.1 Valley Elderberry Longhorn Beetle

The VELB is federally listed as threatened. The current known range of the VELB extends throughout California's Central Valley and associated foothills from about the 3,000-foot contour on the east and the watershed of the Central Valley on the west (U.S. Fish and Wildlife Service 1999:1). The VELB is dependent on its host plant, elderberry, which is a common component of riparian corridors and adjacent upland areas in the Central Valley (Barr 1991:5).

The VELB has four stages of life: egg, larva, pupa, and adult. Females deposit eggs on or adjacent to the host elderberry. Egg production varies, and females have been observed to lay between 16 and 180 eggs. Eggs hatch within a few days of being deposited and larvae emerge. The larvae bore into the wood of the host plant and create a long feeding gallery in the pith of the elderberry stem. The larvae feed on the pith of the plant for 1–2 years. When a larva is ready to pupate, it chews an exit hole to the outside of the stem and then plugs it with wood shavings. The larva then retreats into the feeding gallery to an enlarged pupal chamber. The larvae metamorphose into pupae between December and April; the pupal stage is thought to last about a month. The adult remains in the chamber for several weeks after the pupal phase and then emerges from the chamber through the exit hole, which is typically 4–10 millimeters (mm) in diameter and circular to oval in shape. Adults emerge between mid-March and mid-June, the flowering season of the plant. Adults feed on elderberry leaves and mate within the elderberry canopy (Talley et al. 2006a:7–9).

4.3.1.1 Survey Results

ICF wildlife biologist John Howe surveyed for and mapped elderberry shrubs in the BSA during the April 8, 2015 field survey. Seven elderberry shrubs were identified within the BSA. Five shrubs are located on the West Sacramento side, and two are on the Sacramento side of the BSA (Figure 3-1). The results of the survey are summarized in Table 4-2. Shrub 1 was observed to be a re-sprout from an elderberry stump, which appeared to have been cut down. The stump was measured to be approximately 12 inches in diameter at ground level; multiple new stems were growing out of it and from the surrounding soil. Shrub 5 also was cut down at some point; it had

two stumps greater than 5 inches in diameter with new stems growing out of them. Table 4-2 reports only those stems that currently provide habitat for VELB (i.e., the cut stumps themselves are not included). VELB has been documented approximately 0.5 mile north of the BSA along the west bank of the Sacramento (California Department of Fish and Wildlife 2015).

Table 4-2. Elderberry Shrub Survey Results

Shrub Number	Stem Diameter Class at Ground Level in Inches			Shrub Height in Feet	Exit Holes Present?	Shrub in Riparian Habitat?
	≥1–≤3	>3–<5	≥ 5			
1	4	0	0	6	No	No
2	0	1	1	22	No	No
3	0	0	1	12	No	No
4	4	3	0	15	No	No
5	18	0	0	10	No	No
6	6	0	3	26	No	No
7	0	0	1	20	No	Yes
Total	**32**	**4**	**6**			

4.3.1.2 Project Impacts

Five of the seven shrubs (shrubs 1, 2, 3, 5, and 7) would be directly affected (removed or trimmed) by project construction, regardless of roadway design or residential access alternative, and the other two (shrubs 4 and 6) could be indirectly affected by project construction (i.e., impacts between 20 and 100 feet from the shrub dripline). Shrubs 1, 2, 3, and 7 all fall within areas identified as temporarily impacted by project construction. Although these shrubs ultimately may be able to be avoided, construction activities would likely be within 20 feet of the shrub driplines. Shrub 5 would be permanently impacted with the connection of B and C Streets under both Alternatives 1 and 2 within the City of West Sacramento.

Shrub 4 is approximately 80 feet west of areas identified for temporary disturbance associated with the removal of the West Sacramento approach structure; Shrub 6 occurs immediately adjacent to the area identified as temporarily affected and less than 20 feet from areas of permanent impact. The USFWS typically considers project activities that result in a change in hydrology, fragmentation of habitat, drift of fertilizers or pesticides, increased pedestrian traffic, artificial lighting, and dust as potential indirect effects on the species. The project will not result in any of these effects on shrubs 4 and 6. Both shrubs occur in and adjacent to developed areas that are already subject to pedestrian traffic, artificial lighting, and the potential use of herbicides and pesticides from adjacent developed areas. The project construction that would occur within 100 feet of Shrub 4 is limited to the removal of the approach structure on the West Sacramento side of the river, which would not result in an alternation of the hydrology in this area. Although work would occur within 20 feet of shrub 6, it is located on the embankment of I-5, which is

above the current grade. Thus, construction activities at Bercut Drive and Railyards Boulevard are not likely to substantially alter the hydrology in the area around the shrub such that it would be adversely affected. Talley et al. (2006b:647) found that, in fact, elderberry shrubs adjacent to paved surfaces were less stressed that those near dirt surfaces, possibly because increased runoff from paved surfaces benefitted the shrubs. Talley et al. also found that dust from low-traffic dirt roads trails and paved roads did not affect VELB presence in shrubs either directly or indirectly through changed elderberry condition (Talley et al. 2006b:647). Therefore, project dust is not expected to affect the VELB or its habitat associated with shrubs 4 and 6. Though shrubs 4 and 6 occur within 100 feet of project construction, construction activities and the operation of the project are not expected to result in a change in condition that could result in take of VELB.

Project construction, regardless of roadway design or residential access alternative, is likely to adversely affect the federally threatened VELB through the loss of suitable habitat in accordance with the definition of take under the ESA.

4.3.1.3 Avoidance and Minimization Efforts

Implementation of Measures 1–3, 8, and 9 would ensure that construction activities avoid and minimize impacts on VELB within and adjacent to the BSA.

Measure 8: Avoid and Minimize Impacts on Valley Elderberry Longhorn Beetle

The following measures will be implemented prior to and during construction to ensure that the proposed project does not adversely affect elderberry shrubs adjacent to the project footprint.

- Consistent with Measure 2, contractors will be briefed on the need to avoid damaging the elderberry shrubs and the possible penalties for not complying with these requirements. Crews also will be educated on the status of the VELB and the need to protect its habitat.
- All elderberry shrubs that are outside of the permanent project footprint or that can be avoided will be identified on construction drawings, with notes indicating that they are sensitive resources to be avoided.
- Consistent with Measure 1, orange construction barrier fencing will be placed at a minimum of 20 feet from each shrub's dripline [fencing around shrub 6 (construction will be within 20 feet) will be placed as far out from the dripline as possible]. No construction activities will be permitted within the buffer zone other than those activities necessary to erect the fencing. As specified in the Conservation Guidelines for the Valley Elderberry Longhorn Beetle (Guidelines) (U.S. Fish and Wildlife Service 1999), signs will be posted every 50 feet (at a minimum) along the perimeter of the buffer area fencing. The signs will contain the following information: *This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment*. The signs

should be clearly readable from a distance of 20 feet and must be maintained for the duration of construction.

- Consistent with Measure 3, buffer area fences around the shrubs will be inspected weekly by a biological monitor during ground-disturbing activities and monthly after ground-disturbing activities until project construction is complete or until the fences are removed, as approved by the biological monitor. The biological monitor will be responsible for ensuring that the contractor maintains the buffer area fences around elderberry shrubs throughout construction. Biological inspection reports will be provided to USFWS and the project proponent.

Measure 9: Transplant Elderberry Shrubs That Cannot Be Avoided

Elderberry shrubs that cannot be avoided will be transplanted to a USFWS-approved conservation area in accordance with the Guidelines (U.S. Fish and Wildlife Service 1999). Transplanting will occur during the plant's dormant phase (approximately November through the first 2 weeks of February, after they have lost their leaves). A qualified specialist familiar with elderberry shrub transplantation procedures will supervise the transplanting. The location of the conservation area transplantation site will be approved by USFWS before removal of the shrubs.

4.3.1.4 Compensatory Mitigation

Implementation of Measure 10 would compensate for direct impacts on VELB habitat.

Measure 10: Compensate for Impacts on Valley Elderberry Longhorn Beetle Habitat

Before construction begins, the project proponent will compensate for direct impacts (including transplanting) on all elderberry stems measuring 1 inch or more at ground level (i.e., habitat for VELB) that are located within 20 feet of proposed construction activities. Compensation will include planting replacement elderberry seedlings or cuttings and associated native plantings in a USFWS-approved conservation area, at a ratio between 1:1 and 8:1 (ratio = new plantings to affected stems), depending on the diameter of the stem at ground level, the presence or absence of exit holes, and whether the shrub is located in riparian habitat (U.S. Fish and Wildlife Service 1999).

Mitigation credits for VELB will be purchased at a USFWS-approved mitigation bank. The exact amount and location of compensatory mitigation will be based on consultation with USFWS.

Table 4-3 summarizes the compensation required for direct effects on up to five elderberry shrubs (shrubs 1, 2, 3, 5, and 7) that provide VELB habitat. Based on stem counts listed in Table 4-2 for these five shrubs and in accordance with the Guidelines, 34 elderberry seedlings and 34 associated native plants will be planted in a USFWS-approved conservation area. This compensation may be reduced if some of the shrubs occurring within temporary impact areas (shrubs 1, 2, 3, and 7) can be avoided once more detailed plans are available.

Table 4-3. Required Compensation for Directly Affected Elderberry Shrubs

Habitat	Stem Diameter	Number of Stems	Exit Holes?	Seedling Ratio	Native Plant Ratio	Total Seedling	Total Native Plants
Riparian	Stems >1" to <3"	0	No	2:1	1:1	0	0
	Stems >1" to <3"	0	Yes	4:1	2:1	0	0
	Stems >3" to <5"	0	No	3:1	1:1	0	0
	Stems >3" to <5"	0	Yes	6:1	2:1	0	0
	Stems >5"	1	No	4:1	1:1	4	4
	Stems >5"	0	Yes	8:1	2:1	0	0
Nonriparian	Stems >1" to <3"	22	No	1:1	1:1	22	22
	Stems >1" to <3"	0	Yes	2:1	2:1	0	0
	Stems >3" to <5"	1	No	2:1	1:1	2	2
	Stems >3" to <5"	0	Yes	4:1	2:1	0	0
	Stems >5"	2	No	3:1	1:1	6	6
	Stems >5"	0	Yes	6:1	2:1	0	0
Total		**26**				**34**	**34**

4.3.1.5 Cumulative Impacts

With implementation of the avoidance and minimization efforts and compensatory mitigation, construction of the proposed project would not add to cumulative effects on VELB in the region.

4.3.2 Western Pond Turtle

Western pond turtle is a California species of special concern. Western pond turtle occurs throughout much of California, except east of the Sierra-Cascade crest and desert regions (with the exception of the Mojave River and its tributaries) (Zeiner et al. 1988:100). Aquatic habitats used by pond turtles include ponds, lakes, marshes, rivers, streams, and irrigation ditches with a muddy or rocky bottom in grassland, woodland, and open forest areas (Stebbins 2003:250). Pond turtles spend a considerable amount of time basking on rocks, logs, emergent vegetation, mud or sand banks, or human-generated debris (Jennings et al. 1992:11). Pond turtles move to upland areas adjacent to watercourses to deposit eggs and overwinter (Jennings and Hayes 1994:98). Turtles have been observed overwintering several hundred meters from aquatic habitat. In the southern portion of their range and along the central coast, pond turtles are active year-round. In the remainder of their range, these turtles typically become active in March and return to overwintering sites by October or November. (Jennings et al.1992:11.)

4.3.2.1 Survey Results

No pond turtles were observed in the BSA during the reconnaissance-level surveys. The Sacramento River provides suitable aquatic habitat for the species, and the banks on the Sacramento River and adjacent uplands may be used for basking and nesting. Although there is a high amount of disturbance within uplands in the BSA, including domestic dogs and cats that may prey on pond turtles or pond turtle eggs, pond turtles may still attempt to nest in these areas

if they are present in the adjacent aquatic habitat. The species has been recorded within 10 miles of the BSA (California Department of Fish and Wildlife 2015).

4.3.2.2 Project Impacts

The proposed project would affect potential western pond turtle nesting habitat on both sides of the Sacramento River. Construction of the proposed project with City of West Sacramento Residential Access Alternative 1 would result in a total of 4.5 acres of permanent impacts and 3.7 acres of temporary impacts on areas that could support western pond turtle nesting (cottonwood riparian forest, riparian forest/shrub wetland, and ruderal woodland). Construction of the proposed project with City of West Sacramento Residential Access Alternative 2 would result in a total of 3.3 acres of permanent impacts and 3.4 acres of temporary impacts on areas that could serve as nesting habitat.

The proposed project would require two seasons of temporary in-channel work that could result in injury and mortality to pond turtles. Injury or mortality could result from placement of equipment and materials into the river channel and on the river banks. In addition, underwater vibrations from pile driving could result in injury to pond turtles if they are in the vicinity. Construction activities, including noise and visual disturbance, also could temporarily discourage pond turtles from foraging and basking near the project site.

4.3.2.3 Avoidance and Minimization Efforts

Implementation of Measures 1–3, 5, and 11 would ensure that construction activities avoid or minimize impacts on western pond turtle within and adjacent to the limits of disturbance associated with construction.

> **Measure 11: Conduct Preconstruction Surveys for Western Pond Turtle and Allow Turtles to Leave Work Area Unharmed**
>
> To avoid potential injury to or mortality of western pond turtles, the project proponent will retain a qualified biologist to conduct a preconstruction survey for western pond turtles immediately prior to construction activities (including vegetation removal) along the banks of the Sacramento River. The biologist will survey the aquatic habitat, river banks, and adjacent riparian and ruderal habitat within the construction area immediately prior to disturbance.
>
> If a western pond turtle is found within the immediate work area during the preconstruction survey or during project activities, work shall cease in the area until the turtle is able to move out of the work area on its own. Information about the location of turtles seen during the preconstruction survey will be included in the environmental awareness training (Measure 2) and provided directly to the construction crew working in that area to ensure that areas where turtles were observed are inspected each day prior to the start of work to ensure that no turtles are present.

If a western pond turtle nest is discovered during the preconstruction survey or during project construction, the project proponent will coordinate with CDFW to determine whether additional avoidance measures (e.g., no-disturbance buffer or monitoring) is prudent.

4.3.2.4 Compensatory Mitigation

No compensatory mitigation is required.

4.3.2.5 Cumulative Impacts

Because measures will be implemented to avoid and minimize potential impacts on western pond turtle, the project would not contribute to cumulative effects on this species.

4.3.3 Swainson's Hawk

Swainson's hawk is state listed as threatened. Swainson's hawks forage in grasslands, grazed pastures, alfalfa and other hay crops, and certain grain and row croplands. Vineyards, orchards, rice, and cotton crops are generally unsuitable for foraging because of the density of the vegetation (California Department of Fish and Game 1992:41). The majority of Swainson's hawks winter in South America, although some winter in the United States. Swainson's hawk arrives in California in early March to establish nesting territories and breed (California Department of Fish and Game 1994:5). They usually nest in large, mature trees. Most nest sites (87%) in the Central Valley are found in riparian habitats (Estep 1989:35), primarily because trees are more available there. Swainson's hawks also nest in mature roadside trees and in isolated trees in agricultural fields or pastures. The breeding season is from March through August (Estep 1989:12, 35).

4.3.3.1 Survey Results

No Swainson's hawks were observed during the April 2014 and May 2015 surveys. The CNDDB contains several records for Swainson's hawk both upstream and downstream of the BSA, with the nearest record approximately 0.2 mile north of the BSA on the west side of the river in 2007 (California Department of Fish and Wildlife 2015).

Trees within the cottonwood riparian forest, riparian forest/shrub wetland, ruderal woodland, and landscaped area represent potential nesting habitat for Swainson's hawk.

4.3.3.2 Project Impacts

The proposed project would affect potential Swainson's hawk nesting habitat on both sides of the Sacramento River. Construction of the proposed project with City of West Sacramento Residential Access Alternative 1 would result in a total of 5.0 acres of permanent impacts and 4.4 acres of temporary disturbance in areas that support suitable nest trees (cottonwood riparian forest, riparian forest/shrub wetland, landscaped, and ruderal woodland). Construction of the

proposed project with City of West Sacramento Residential Access Alternative 2 would result in a total of 3.8 acres of permanent impacts and 4.0 acres of temporary disturbance in areas that could support suitable nest trees.

Noise and visual disturbances associated with project construction during the nesting season may disrupt Swainson's hawk nesting behavior to the point of nest abandonment or forced fledging that results in young mortality. Nest that are located within or adjacent to the BSA could be affected by typical construction noise and visual disturbances. Because the BSA has high levels of pedestrian, bike, vehicle, and boat traffic and associated noise, most construction activities may not substantially increase noise and visual disturbance above baseline conditions. However, pile driving and the use of cranes in proximity to an active nest are expected to exceed existing levels of noise disturbance. Bridge construction will require impact pile driving to be spread out over two summer construction seasons. These loud noises could startle Swainson's hawk beyond the BSA and disrupt normal behaviors, including nesting. CDFW typically considers intensive new disturbances in developed areas to have potential impacts on active Swainson's hawk nests located in urban areas that are within 0.25 mile of the activity (California Department of Fish and Game 1994:10).

4.3.3.3 Avoidance and Minimization Efforts

Implementation of Measures 1–3 and 12–14 would ensure that construction activities avoid or minimize potential impacts on Swainson's hawk within and adjacent to the limits of disturbance associated with project construction.

Measure 12: Conduct Focused Surveys for Nesting Swainson's Hawk prior to Construction

The project proponent will retain a wildlife biologist experienced in surveying for Swainson's hawk to conduct surveys for the species in the spring/summer prior to construction. The surveys will be conducted within the limits of disturbance and in a buffer area up to 0.25 mile from the limits of disturbance. The size of the buffer area surveyed will be based on the type of habitat present and the line-of-sight from the construction area to surrounding suitable breeding habitat. Surveys will follow the methods in Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee 2000). A minimum of six surveys will be conducted according to these methods. If a variance of the survey distance or number of surveys is necessary, the project proponent will coordinate with CDFW regarding appropriate survey methods based on proposed construction activities. Surveys generally will be conducted from February to July. Survey methods and results will be reported to the project proponent and CDFW.

Measure 13: Conduct Tree Removal during Non-Sensitive Periods for Wildlife

The project proponent will remove or trim trees during the non-breeding season for tree-nesting migratory birds and raptors, and prior to periods when bats would be hibernating (generally between September 15 and October 31). If tree removal cannot be confined to this period, the project proponent will retain a qualified wildlife biologist with knowledge of the wildlife species that could occur in the project area to conduct the appropriate preconstruction surveys and establish no-disturbance buffers for sensitive wildlife species as described under Measure 14 (Swainson's hawk), Measure 15 (nesting birds), and Measure 20 (roosting bats).

Measure 14: Monitor Active Swainson's Hawk Nests during Pile Driving and other Construction Activities

Active Swainson's hawk and white-tailed kite nests within 600 feet of the BSA will be monitored during pile driving and other construction activities. Monitoring will be conducted by a wildlife biologist with experience in monitoring Swainson's hawk and white-tailed kite nests. The monitor will document the location of active nests, coordinate with the project proponent and CDFW, and record all observations in a daily monitoring log. The monitor will have the authority to temporarily stop work if activities are disrupting nesting behavior to the point of resulting in potential take (i.e., eggs and young chicks still in nests and adults appear agitated and could potentially abandon the nest). The monitor will work closely with the contractor, the project proponent, and CDFW to develop plans for minimizing disturbance, such as modifying or delaying certain construction activities.

A minimum non-disturbance buffer of 600 feet (radius) will be established around all active Swainson's hawk and white-tailed kite nests. No entry of any kind related to construction will be allowed within this buffer while the nest is active, unless approved by CDFW through issuance of an Incidental Take Permit or through consultation during project construction. The buffer size may be modified based on site-specific conditions, including line-of-sight, topography, type of disturbance, existing ambient noise and disturbance levels, and other relevant factors. Entry into the buffer for construction activities will be granted when the biological monitor determines that the young have fledged and are capable of independent survival or that the nest has failed and the nest site is no longer active. All buffer adjustments will be approved by CDFW.

4.3.3.4 Compensatory Mitigation

The mitigation for riparian impacts (Measure 4) and replacement of protected trees (Measure 32) would offset the loss of potential Swainson's hawk nesting habitat within the BSA. Replacement habitat will occur within the Sacramento Valley population of Swainson's hawk and will include tree species suitable for Swainson's hawk nesting.

4.3.3.5 Cumulative Impacts

Because measures will be implemented to avoid and minimize potential impacts on Swainson's hawk and because the loss of riparian habitat and protected trees will be mitigated, the project would not likely contribute to cumulative impacts on this species.

4.3.4 White-Tailed Kite

White-tailed kite is fully protected by the CFGC. White-tailed kite occurs in coastal and valley lowlands in California (Zeiner et al. 1990:120). White-tailed kites generally inhabit low-elevation grassland, savannah, oak woodland, wetland, agricultural, and riparian habitats. Some large shrubs or trees are required for nesting and for communal roosting sites. Nest trees range from small, isolated shrubs and trees to trees in relatively large stands (Dunk 1995:6, 8). White-tailed kites make nests of loosely piled sticks and twigs lined with grass and straw, near the top of dense oaks, willows, and other tree stands. The breeding season lasts from February through October and peaks from May to August. They forage in undisturbed, open grassland, meadows, farmland, and emergent wetlands. (Zeiner et al. 1990:120.)

4.3.4.1 Survey Results

Focused surveys for white-tailed kite were not conducted, and no kites were observed during the April 2014 and May 2015 field surveys. There are numerous records of white-tailed kite nesting within 10 miles of the BSA; the nearest is approximately 1.75 miles east of the BSA (California Department of Fish and Wildlife 2015). There is an eBird (2015) record for a sighting of white-tailed kite on July 21, 2014, just south of the I Street Bridge on the West Sacramento side of the river.

Trees within the cottonwood riparian forest, riparian forest/shrub wetland, ruderal woodland, and landscaped area represent potential nesting habitat for white-tailed kite.

4.3.4.2 Project Impacts

The proposed project would affect potential white-tailed kite nesting habitat on both sides of the Sacramento River. Construction of the proposed project with City of West Sacramento Residential Access Alternative 1 would result in a total of 5.0 acres of permanent impacts and 4.4 acres of temporary impacts on areas that support suitable nest trees for the kite (cottonwood riparian forest, riparian forest/shrub wetland, landscaped, and ruderal woodland). Construction of the proposed project with City of West Sacramento Residential Access Alternative 2 would result in a total of 3.8 acres of permanent impacts and 4.0 acres of temporary impacts on areas that could support suitable nest trees.

Noise and visual disturbances associated with project construction during the nesting season may disrupt white-tailed kite nesting behavior to the point of nest abandonment or forced fledging

that results in mortality of young. Nest that are located within or adjacent to the BSA could be affected by typical construction noise and visual disturbances. Because the BSA has high levels of pedestrian, bike, vehicle, and boat traffic and associated noise, most construction activities may not substantially increase noise and visual disturbance above baseline conditions. However, pile driving and the use of cranes near an active nest is expected to exceed existing levels of noise disturbance. Bridge construction will require impact pile driving spread over two summers. These loud noises could startle white-tailed kites beyond the BSA and disrupt normal behaviors, including nesting. Because white-tailed kite is a fully protected species, removal of trees with active nests and activities that may result in loss of white-tailed kites are prohibited.

4.3.4.3 Avoidance and Minimization Efforts

Implementation of Measures 1–3 and 13–15 would ensure that construction activities avoid or minimize potential impacts on white-tailed kite within and adjacent to the limits of disturbance associated with project construction.

Measure 15: Conduct Preconstruction Surveys for Nesting Migratory Birds, Including Special-Status Birds, and Establish Protective Buffers

The project proponent will retain a qualified wildlife biologist to conduct nesting surveys before the start of construction. These nesting surveys will be conducted in conjunction with the Swainson's' hawk nesting surveys under Measure 12 and will include a minimum of three separate surveys to look for active nests of migratory birds, including raptors. Surveys will include a search of all trees and shrubs, ruderal areas, and grassland vegetation that provide suitable nesting habitat within 50 feet of disturbance. In addition, a 0.25-mile area from the river will be surveyed for nesting raptors in order to identify raptors that might be affected by pile driving. Surveys should occur during the height of the breeding season (March 1 to June 1), with one survey occurring in each of the 2 consecutive months within this peak period and the final survey occurring within 1 week of the start of construction. If no active nests are detected during these surveys, no additional measures are required.

If an active nest is found in the survey area, a no-disturbance buffer will be established to avoid disturbance or destruction of the nest site until the end of the breeding season (September 15) or until after a qualified wildlife biologist determines that the young have fledged and moved out of the construction area (this date varies by species). The extent of these buffers will be determined by the biologist in coordination with CDFW and will depend on the level of noise or construction disturbance taking place, line-of-sight between the nest and the disturbance, ambient levels of noise and other non-project disturbances, and other topographical or artificial barriers. Suitable buffer distances may vary between species.

4.3.4.4 Compensatory Mitigation

The mitigation for riparian impacts (Measure 4) and replacement of protected trees (Measure 32) would offset the loss of potential white-tailed kite nesting habitat within the BSA.

4.3.4.5 Cumulative Impacts

Because measures will be implemented to avoid and minimize potential impacts on white-tailed kite, and because white-tailed kite also would benefit from compensatory mitigation for other biological resources, the proposed project would not contribute to cumulative effects on this species.

4.3.5 Purple Martin

Purple martin is designated as a California species of special concern. The species is broadly distributed across eastern North America and occurs locally in the western states (Shuford and Gardali 2008:294). In California, the species occurs as a summer resident and migrant, primarily from mid-March to late September, and breeds from May to mid-August (Shuford and Gardali 2008:294). Purple martins are widely but locally distributed in forest and woodland areas at low to intermediate elevations throughout much of the state (Shuford and Gardali 2008:294). Populations are densest in central and northern coastal coniferous forests and smaller and more localized in the Sierra Nevada, interior foothills, and southern California (Shuford and Gardali 2008:294). The species' range has contracted substantially on the central and southern coastal slope and in the Central Valley (Shuford and Gardali 2008:294). Historically widespread, only one extant population of purple martins persists within the Central Valley. This population nests solely in elevated freeways and overpasses ('bridges") in the Sacramento region (i.e., the City of Sacramento, Sacramento County, and one nest site in western Placer County) (Airola et al. 2009:8). The population of purple martins in the Sacramento region has been steadily declining since 2002, going from 135 breeding pairs down to 30 breeding pairs in 2014 (Airola et al. 2014:14).

4.3.5.1 Survey Results

The population of purple martin in the Sacramento area in 2014 was reported at 30 pairs, with 7 of those pairs occurring within the BSA. The 7 pairs were reported to be nesting in the vent holes that are on the underside of the approach structure heading east from the I Street Bridge to J Street (Airola et al. 2014:14). The number of nesting pairs on the I Street Bridge approach structure has significantly declined over the last 10 years, with a marked drop from 32 pairs in 2005 to 17 pairs in 2006 to a low of 4 pairs in 2010 (Airola et al. 2014:14).

Possible threats to these urban populations likely include changes in habitat conditions (i.e., increases in train and car traffic, loss of flight access to nesting areas, loss of perch sites, and loss of nest material collection areas), use of neonicotinoid insecticides, increased predation by kestrels and feral cats, and competition for nests sites with white-throated swifts (Airola et al. 2014).

4.3.5.2 Project Impacts

The proposed project would result in the removal of the approach structures and thus the removal of the purple martin nesting habitat within the BSA. Based on the most recent population estimates, the loss of nesting habitat within the BSA would displace approximately 25% of the Sacramento population of purple martins, which is the only extant population in the Central Valley.

Removal of the approach structures, if not timed properly, could remove active nests or directly disrupt breeding behavior and potentially result in mortality and injury of adults, young, and eggs.

An existing perching wire located just north of the I Street Bridge approach structure, at the edge of the State Parks parking lot, was installed as mitigation for a nearby project. This perching wire will not be removed as part of the approach structure demolition and would continue to be used by purple martins if replacement habitat (see Measure 18) is created near the perch. On both the east and west sides of the Sacramento River, several utility lines that are in proximity to the future bridge would be available to purple martins for perching.

As part of the proposed project, landscaping would be incorporated along the road improvements on the West Sacramento side of the BSA, which would provide purple martins a source for gathering nesting materials, if replacement habitat is situated nearby. In addition, the levee on the West Sacramento side will remain vegetated in herbs and grasses, which would provide another area for purple martins to gather nesting material if they nest on the West Sacramento side of the bridge and if additional replacement habitat is located in this area (see Measure 18 below).

4.3.5.3 Avoidance and Minimization Efforts

Implementation of Measures 1–3, 16, and 17 would avoid and minimize impacts on purple martins, as well as other nesting birds and bats that use the approach structures.

> **Measure 16: Avoid and Minimize Impacts on Purple Martins during Construction Activities**
>
> No construction activity that results in ground disturbance, modification of the I Street Bridge approach structure, loud noises, and/or vibrations will be conducted within 100 feet of the edge of the purple martin colony during the purple martin nesting season (March 15 to August 15). In addition, no construction-related vehicles or machinery shall be operated or stored beneath the colony during this period or until a qualified biologist determines that the purple martins have completed nesting and are no longer occupying the structure.

Measure 17: Avoid and Minimize Impacts on Nesting Birds and Roosting Bats from Demolition of Approach Structures

Because all four of the approach structures that are associated with the I Street Bridge are used by nesting birds (including purple martin) and roosting bats, the removal of these structures will take place outside of the breeding season for migratory birds and bats, and will be conducted in the following manner to avoid and minimize direct harm and temporary disturbance to nesting birds and roosting bats.

Timing of Approach Structure Demolition

To avoid and minimize potential impacts on purple martins and bats, the approach structures will not be removed or be altered until after the new I Street Bridge and associated replacement habitat on the bridge and/or elsewhere is in place and available for use by birds and bats for at least one overlapping nesting/maternal season, which generally would be from March 15 to September 15. Exclusion activities will be initiated between September 15 and October 31 to avoid affecting nesting purple martins and other birds, and to avoid affecting maternal and hibernating bat roosts. The exact date of beginning exclusion will be determined based on the results of preconstruction surveys that will be conducted in mid- to late August to document the status of bird nests and bat roosts. Active nests will be periodically monitored until it is verified that they are no longer being used. The non-volant (non-flying) period for most young bats is between April and the beginning of September (Johnston et al. 2004:26).

To avoid and minimize potential noise impacts on migratory birds nesting adjacent to project demolition activities, all demolition activities resulting in loud noise will be conducted outside of the nesting season, which is generally September 15 to February 1, to the extent feasible.

Approach Structure Exclusion Measures

The following exclusion measures will be implemented before demolition of the approach structures and will be approved by the project proponent and CDFW prior to implementation.

The vent holes and expansions joints on the approach structures will be altered to exclude birds and bats from using them prior to initiating demolition activities. After it has been confirmed that purple martins or other birds are no longer nesting in the vent holes, one-way doors will be installed on the vent holes to allow any wildlife (e.g., birds and bats) that may be occupying the hollow box-girders on the existing approach structure to exit and not re-enter. After the one-way doors have been in place for 48 hours, they will be removed and the vent holes will be sealed off to prevent any wildlife from re-entering prior to demolition.

One-way door devices also will be installed along the expansion joints to allow bats to exit but not re-enter. These one-way door devices will be designed such that they do not contain netting or wire mesh that bats could become entangled in. The one-way doors

will remain in place for 48 hours, after which they will be inspected for remaining bats. Once each expansion joint is confirmed to be unoccupied, they will be sealed close with an expanding foam sealant to prevent bats from reoccupying the approach structures.

4.3.5.4 Compensatory Mitigation

Implementation of Measures 18 and 19 would partially compensate for the loss of purple martin habitat and the long-term effects on the Sacramento area population.

Measure 18: Create Purple Martin Replacement Habitat

Purple martin nesting habitat that will be lost due to demolition of the I Street Bridge approach structure will be mitigated in part with replacement habitat. The amount of replacement habitat will be based on the maximum number of pairs observed nesting in the existing approach structure that is proposed for removal, which was 37 pairs in 2002 (Airola et al. 2014: 14). Because of the uncertainty of replacement habitat being used and due to the magnitude of the impact (effects to approximately 25% of the Sacramento population), replacement habitat will be provided at a ratio of 2:1 (replacement habitat to habitat removed). Therefore, the following replacement habitat will be of sufficient size to accommodate at least 74 nesting pairs of purple martins.

Replacement Habitat on New Bridge Structure

The new bridge will include a hollow box-girder design with at least 74 vent holes on the underside to allow for purple martins to use the new structure for nesting. Vent holes intended for use by martins will be at least 20 feet above the ordinary high water mark (OHWM) of the Sacramento River. Each vent hole will be associated with an individual chamber (i.e., a four sided chamber) that is intended for use by a breeding pair and will be at least 10 feet square. Nest guards consisting of ½ inch wire mesh will be installed along the interior edge of the vent hole to prevent nestlings from falling out. The wire mesh will extend at least 1 inch above the floor of the chamber.

Landscaping will be designed to not disrupt the flight access within 120 feet of replacement nesting habitat (i.e., will not physically or visually obstruct the space around the nesting habitat). Small to medium non-fruit-bearing trees shall be incorporate into the landscaping plans. Where possible, pine trees (*Pinus* spp.) also will be incorporated into landscaping plans to provide a permanent source of nesting material for purple martins. If feasible, some mowed or cut vegetation along the West Sacramento levee in the BSA will be left in place between March 15 and May 15 to allow purple martins to use this material for nesting.

Measure 19: Implement a Monitoring and Management Plan for Purple Martins

Because of the current status of the population in the region and the impact of the project on this population, the project proponent will develop and implement a purple martin monitoring and management plan. This plan at a minimum will include the following.

- The monitoring and management plan will be implemented by a wildlife biologist with knowledge of the life history, behavior, and habitat requirements of purple martin and with demonstrated prior experience in monitoring purple martin colonies.
- Monitor use of replacement habitat by purple martins over a 10-year period for a minimum of 5 monitoring years (e.g., years 2, 3, 5, 7, and 10) following the completion of the new bridge and the demolition of the existing approach structure that provides nesting habitat for purple martins. The monitoring period may be extended if it is found that (1) purple martins are not using the replacement habitat; or (2) the replacement habitat is not functioning as intended and repairs are made, or additional replacement habitat is created. At a minimum, the following information will be recorded.
  - Number of nesting pairs.
  - Documentation of which vent holes (or other replacement structures) are used.
  - Documentation of use of perching structures.
  - Effectiveness of landscaped areas and semi-natural areas (vegetated levee) in providing nesting materials.
  - Observations of predation or presence of known predators.
  - Changes in habitat in and around the colony.
- To provide context for how the I Street Bridge colony is doing relative to the remaining population, at least 3 reference colonies in the Sacramento population also will be monitored over the same 10-year period for a minimum of 5 monitoring years following the completion of the project. The reference population monitoring will be conducted concurrently with the replacement monitoring. Information collected during the reference colony monitoring will include at a minimum the following.
  - The number of nesting pairs in at least 3 historical colonies.
  - Other relevant observations on the status of the colonies (e.g., sources of predation, changes in habitat).
- The monitoring and management plan will include adaptive management measures to correct problems with replacement habitat, make other habitat improvements, and/or implement management recommendations within or adjacent to the BSA, or elsewhere within the Sacramento population, in an attempt to boost nesting success. These measures may include but would not be limited to the following.
  - A commitment to replacing poor-functioning or damaged free-standing purple martin nesting and/or perching habitat such that there is no net loss in the amount of created habitat.
  - A process for making and implementing recommendations on the management of vegetation around Sacramento area colonies.

4.3.5.5 Cumulative Impacts

The project's contribution to cumulative impacts on purple martins within the Sacramento region would be considerable. The colony that would be lost represents approximately 25% of the Central Valley population, which has been in decline for several decades due in part to an increase in the European starling population (Shuford and Gardali 2008:295).

4.3.6 Pallid Bat

Pallid bat is designated as a California species of special concern. Pallid bat occurs at low elevations throughout California (Zeiner et al. 1990:70). They occur in a variety of habitat, including grasslands, shrublands, and woodlands, and are most common in open, dry habitats with rocky areas for roosting (Zeiner et al. 1990:70). Pallid bats roost alone, in small groups, or gregariously in crevices in rocky outcrops and cliffs, caves, mines, trees hollows, exfoliating tree bark, and various human structures such as bridges and buildings (Western Bat Working Group 2005).

4.3.6.1 Survey Results

The existing I Street and Jibboom Street approach structures, buildings, and several large trees with cavities within the cottonwood riparian forest, landscaped, and ruderal woodland on both sides of the river provide potential roosting habitat for pallid bats in the BSA. A total of 30 expansion joints, representing 1,132 linear feet of potential roosting habitat, were mapped on the approach structures.

No pallid bats were detected during visual inspections of expansion joints or during acoustic surveys; however, Mexican free-tail bats have been observed in several expansion joints on the Sacramento side of the river, and bats have been reported using the approach structure on the West Sacramento side (Wyatt pers. comm.). No sign of bat occupation (guano) was detected in the tree cavities inspected; however, not all portions of these trees were accessible (e.g., higher portions of trees). Pallid bats may roost in the expansion joints, in trees with cavities, and in buildings within the BSA. The nearest known record of this species is approximately 10 miles west of the BSA near the City of Davis (California Department of Fish and Wildlife 2015).

4.3.6.2 Project Impacts

The proposed project would result in removal of the existing I Street and Jibboom Street approach structures. Potential roosting habitat, consisting of 30 expansion joints, for pallid bats will be removed during project demolition activities. Several large trees with cavities would be removed within the cottonwood riparian forest, landscaped, and ruderal woodland as part of both alternatives. Both City of West Sacramento residential access alternatives also would affect buildings on the West Sacramento side of the BSA that could be used by pallid bats for roosting.

Project construction could result in injury and/or mortality to the species if occupied roost sites are removed at times when bats are not awake and active (e.g., early in the day, periods of cold weather).

4.3.6.3 Avoidance and Minimization Efforts

Implementation of Measures 1–3, 13, 17, and 20 would ensure that construction activities avoid and minimize potential impacts on pallid bat within and adjacent to the limits of disturbance associated with construction.

Measure 20: Conduct Preconstruction Surveys for Roosting Bats and Implement Protective Measures

To avoid and minimize potential impacts on pallid bat, western red bat, and non-special-status bat species from the removal of trees and buildings, the project proponent will implement the following actions.

Preconstruction Surveys

Within 2 weeks prior to tree trimming or removal and any building demolition (e.g., homes, sheds, other outbuildings), a qualified biologist will examine trees to be removed or trimmed and buildings planned for demolition for suitable bat roosting habitat. High-quality habitat features (e.g., large tree cavities, basal hollows, loose or peeling bark, larger snags, abandoned buildings, attics) will be identified, and the area around these features searched for bats and bat sign (e.g., guano, culled insect parts, staining). Riparian woodland and stands of mature broadleaf trees will be considered potential habitat for solitary foliage-roosting bat species.

If suitable roosting habitat and/or bat sign is detected, biologists will conduct an evening visual emergence survey of the source habitat feature, from a half hour before sunset to 1–2 hours after sunset for a minimum of 2 nights. Full-spectrum acoustic detectors will be used during emergence surveys to assist in species identification. If site security allows, detectors should be set to record bat calls for the duration of each night. All emergence and monitoring surveys will be conducted during favorable weather conditions (calm nights with temperatures conducive to bat activity and no precipitation predicted). The biologist will analyze the bat call data using appropriate software and prepare a report that will be submitted to the project proponent and CDFW.

Timing of Tree Removal and Building Demolition

Trees and buildings planned for removal and demolition will have exclusion devices installed between September 15 and October 31 to avoid affecting maternal and hibernating bat roosts. The exact timing of removal and demolition will be determined based on preconstruction surveys of trees and buildings.

Protective Measures

Protective measures may be necessary if it is determined that bats are using buildings or trees in the BSA as roost sites, or if sensitive bats species are detected during acoustic monitoring. The following measures will be implemented when roosts are found within trees or buildings planned for removal according to the timing discussed above. Specific measures will be approved by the project proponent and CDFW prior to excluding bats from occupied roosts.

- Exclusion from buildings or bridge structures will not take place until temporary or permanent replacement roosting habitat is available.
- Exclusion from roosts will take place late in the day or in the evening to reduce the likelihood of evicted bats falling prey to diurnal predators, and will take place during weather and temperature conditions conducive to bat activity.
- Biologists experienced with bats and bat evictions will carry out or oversee the exclusion tasks and will monitor tree trimming and removal, and buildings if they are determined to be occupied.
- Trees that provide suitable roost habitat will be removed in pieces, rather than felling the entire tree and should be done late in the day or in the evening to reduce the likelihood of evicted bats falling prey to diurnal predators, and will take place during warm weather conditions conducive to bat activity.
- Structural changes may be made to a known roost proposed for removal, to create conditions in the roost that are undesirable to roosting bats and encourage the bats to leave on their own (e.g., open additional portals so that temperature, wind, light and precipitation regime in the roost change). Structural changes to the roost will be authorized by CDFW and will be performed during the appropriate exclusion timing (listed above) to avoid harming bats.
- Non-injurious harassment at the roost site, such as ultrasound deterrents or other sensory irritants, may be used to encourage bats to leave on their own.
- One-way door devices will be used where appropriate to allow bats to leave the roost but not to return.
- Prior to building demolition and/or tree removal/trimming and after other eviction efforts have been attempted, any confirmed roost site will be gently shaken or repeatedly struck with a heavy implement such as a sledge hammer or an axe. Several minutes should pass before beginning demolition work, felling trees, or trimming limbs to allow bats time to arouse and leave the roost. A biological monitor will search downed vegetation for dead and injured bats. The presence of dead or injured bats will be reported to CDFW. Injured bats will be transported to the nearest CDFW-permitted wildlife rehabilitation facility.

4.3.6.4 Compensatory Mitigation

Implementation of Measures 21 and 22 would compensate for the loss of bat roosting habitat on the approach structure and ensure that the habitat is functioning. The loss of any tree roosting

habitat will be in part mitigated by Measures 4 and 33, which would restore and protect riparian habitat and compensate for the loss of protected trees.

Measure 21: Replace Bat Roosting Habitat Lost from Demolition of Approach Structures

Bat roosting habitat will be incorporated into the new bridge and, if necessary, additional free-standing roosting habitat (e.g., bat houses) will be created and installed within or adjacent to the BSA. At a minimum ratio of 1:1, 1,132 linear feet of roosting habitat will be created to compensate for the loss of bat roosting habitat associated with the approach structures. Bat replacement habitat will consist of crevice habitat built into the new bridge. Bat replacement habitat will be designed generally following the guidelines in California Bat Mitigation Techniques, Solutions, and Effectiveness (Johnston et al. 2004), which provides a review of mitigation options for bats in relation to Caltrans projects. Final plans for bat habitat replacement will be approved by the project proponent and CDFW.

Measure 22: Monitor Bat Replacement Habitat

The project proponent will be responsible for monitoring replacement bat habitat over a 5-year period for a minimum of 3 years (e.g., years 2, 3, and 5) to determine whether bats are using the habitat, determine whether the habitat is functioning as intended, and identify any corrective actions that need to be made to the habitat to improve its use by bats. Bat use will be documented through a combination of visual observation (bats and bat sign), which could be conducted during the day where roosting bats are visible or at night during an emergence survey. Acoustic recordings will be used in combination with emergence surveys to attempt to identify the species of bat(s) using the replacement habitat. The locations and amount of occupied habitat will be recorded. Recommendations for corrective actions will be presented to the project proponent and CDFW for approval. Annual monitoring reports will be sent to the project proponent and CDFW.

4.3.6.5 Cumulative Impacts

Because measures will be implemented to avoid and minimize potential impacts on pallid bat, and because permanently affected bat roosting habitat would be compensated for by implementation of Measures 21 and 22, the project would not contribute to cumulative effects on this species.

4.3.7 Western Red Bat

Western red bat is designated as a California species of special concern. Western red bat occurs along the California coast from Mendocino County south to San Diego and into the Sierra Nevada, but the most significant distribution in the state is within the Central Valley (Pierson et al. 2006:12). Western red bat roost is typically solitary, roosting primarily in the foliage of trees or shrubs (Western Bat Working Group 2005). Day roosts are commonly in edge habitats

adjacent to streams or open fields (Western Bat Working Group 2005). In the Central Valley, they are more common in areas with wide strips of mature cottonwoods and sycamores (*Platanus racemosa*) (Pierson et al. 2006:12). They are also known to roost in orchard trees, in particular, walnut orchards (Pierson et al. 2006:13)

4.3.7.1 Survey Results

The cottonwood riparian forest, riparian forest/shrub wetland, landscaped, and ruderal woodland on both sides of the river provide potential roosting habitat in the BSA for western red bats.

Western red bats were detected within the BSA on the night of June 11, 2015, during acoustic surveys on the West Sacramento side of the river. The species has not been previously reported within 10 miles of the BSA (California Department of Fish and Wildlife 2015).

4.3.7.2 Project Impacts

The proposed project would affect potential western red bat roosting habitat on both sides of the Sacramento River. Construction of the proposed project with City of West Sacramento Residential Access Alternative 1 would result in a total of 5.0 acres of permanent impacts and 4.4 acres of temporary impacts on areas that could support the species (cottonwood riparian forest, riparian forest/shrub wetland, landscaped, and ruderal woodland). Construction of the proposed project with City of West Sacramento Residential Access Alternative 2 would result in a total of 3.8 acres of permanent impacts and 4.0 acres of temporary impacts on areas that could support the species.

Project construction could result in injury and/or mortality to the species if habitat they are roosting in is removed at times when they are not active (e.g., early in the day, periods of cold weather).

4.3.7.3 Avoidance and Minimization Efforts

Implementation of Measures 1–3, 13, and 20 would ensure that construction activities avoid and minimize potential impacts on western red bat within and adjacent to the limits of disturbance associated with construction.

4.3.7.4 Compensatory Mitigation

No specific compensatory mitigation for western red bat is recommended. Western red bat would generally benefit from the replacement of riparian habitat under Measure 4 and the replacement of protected trees under Measure 32.

4.3.7.5 Cumulative Impacts

Because measures will be implemented to avoid and minimize potential impacts on western red bat, and because permanently affected riparian habitat would be compensated for by

implementation of Measure 4, the project would not contribute to cumulative effects on this species.

4.4 Special-Status Fish Species

As described in Chapter 3, Environmental Setting, special-status fish species known to occur in the BSA were identified after a review of the CNDDB search results; the USFWS and NMFS lists of endangered, threatened, and proposed species within the project region; and species' distribution and habitat data (e.g., Moyle 2002; U.S. Fish and Wildlife Service 2015b). Table 3-4 lists all special-status fish species that were identified as occurring in the project region. Table 4-4 summarizes the life stage timing and distribution of special-status species potentially affected by the proposed project. The special-status species and their designated critical habitats, where a

4.4.1 Sacramento River Winter-Run Chinook Salmon

4.4.1.1 Status and Distribution

The Sacramento River winter-run Chinook salmon Evolutionarily Significant Unit (ESU) (*Oncorhynchus tshawytscha*) was listed as threatened under ESA on August 4, 1989, under an emergency rule. NMFS subsequently reclassified the ESU as endangered on January 4, 1994, and reaffirmed this listing on June 28, 2005. NMFS designated critical habitat for Sacramento River winter-run Chinook salmon on June 16, 1993 (58 Federal Register [FR] 33212–33219). The ESU includes all naturally spawned populations of winter-run Chinook in the Sacramento River and its tributaries, as well as populations from two artificial propagation programs—one at the Livingston Stone National Fish Hatchery (LSNFH) and the other at Bodega Marine Laboratory (discontinued in 2004) (National Marine Fisheries Service 2005a). The Sacramento River winter-run Chinook salmon ESU was listed as endangered under CESA in September 1989.

Prior to construction of Shasta Dam, winter-run Chinook salmon spawned in the upper reaches of the Sacramento River, the McCloud River, and the lower Pit River. Spawning is now restricted to approximately 44 miles of the mainstem Sacramento River, immediately downstream of Keswick Dam (Yoshiyama et al. 1998). The abundance of winter-run Chinook salmon in the Sacramento River before Shasta Dam was constructed is unknown. Some biologists believe that the run was relatively small, possibly consisting of a few thousand fish (Slater 1963). Others, relying on anecdotal accounts, believe that the run could have numbered more than 200,000 fish (National Marine Fisheries Service 1993). During the mid-1960s, more than 20 years after the construction of Shasta Dam, the population exceeded 80,000 fish (U.S. Department of the Interior, Bureau of Reclamation 1986). The population declined substantially during the 1970s and 1980s.

Table 4-4. Life Stage Timing and Distribution of Special-Status Fish Species Potentially Affected by the Proposed Project

Species/Life Stage	Distribution	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Winter-Run Chinook Salmon													
Adult migration and holding	San Francisco Bay to upper Sacramento River	■	■	■	■	■	■					■	■
Juvenile movement and rearing	Upper Sacramento River to San Francisco Bay	■	■	■	■							■	■
Spring-Run Chinook Salmon													
Adult migration	San Francisco Bay to upper Sacramento River and tributaries			■	■	■	■	■					
Juvenile movement	Upper Sacramento River and tributaries to San Francisco Bay	■	■	■	■	■					■	■	■
Late Fall–Run Chinook Salmon													
Adult migration	San Francisco Bay to upper Sacramento River and tributaries	■	■								■	■	■
Juvenile movement and rearing	Upper Sacramento River and tributaries	■	■	■	■	■	■				■	■	■
Fall-Run Chinook Salmon													
Adult migration and holding	San Francisco Bay to upper Sacramento River and tributaries							■	■	■	■	■	■
Juvenile movement	Upper Sacramento River and tributaries to San Francisco Bay	■	■	■	■	■	■						
Steelhead													
Adult migration	San Francisco Bay to upper Sacramento River and tributaries	■	■	■						■	■	■	■
Juvenile and smolt movement	Upper Sacramento River and tributaries to San Francisco Bay	■	■	■	■	■	■				■	■	■
Green Sturgeon													
Adult migration and holding	San Francisco Bay to upper Sacramento River		■	■	■	■	■						
Juvenile rearing (natal stream to estuary)	Upper Sacramento River to San Francisco Bay	■	■	■	■	■	■	■	■	■	■	■	■
Juvenile movement and rearing	Upper Sacramento River to San Francisco Bay					■	■	■	■				

Species/Life Stage	Distribution	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Delta Smelt													
Adult migration	South Delta to north Delta and lower Sacramento River												
Spawning	Upper Delta to lower Sacramento River												
Longfin Smelt													
Adult migration and spawning	San Francisco Bay to upper Delta												
Sacramento Splittail													
Adult migration and spawning	Suisun Bay/Marsh to lower Sacramento and San Joaquin Rivers, including Yolo Bypass												
River Lamprey													
Adult migration and spawning	Pacific Ocean to Sacramento River												
Ammocoete stage, metamorphosis and movement	Sacramento River to Delta												

Note: Gray shading indicates primary periods of species and life stage occurrence included in the assessment of project effects.
Sources: Wang and Brown 1993; U.S. Fish and Wildlife Service 1996; McEwan 2001; Moyle 2002; Hallock 1989; Beamesderfer et al. 2005.

Historically, four independent populations of winter-run Chinook were delineated in the Sacramento River ESU. The areas used for spawning by three of these populations are now inaccessible because they are above the impassable Keswick and Shasta Dams, while conditions for a fourth population (Battle Creek) are at present unsuitable due to high summer water temperatures. Lindley et al. (2007) concluded that the mainstem Sacramento River population was at a low risk of extinction based on data up to 2004. However, the ESU as a whole is not considered viable because there is only one naturally spawning population that is found outside its historical range. Furthermore, there is some concern over the introgression of naturally-produced fish with hatchery-produced fish from LSNFH, although the risk is still thought to be low when considering extinction risk.

In 1989, winter-run Chinook salmon escapement was estimated at less than 550 adults. Escapement continued to decline, diminishing to an estimated 450 fish in 1990 and 191 fish in 1991. The rapid decline in escapement during the late 1980s and early 1990s prompted listing of the winter-run Chinook salmon as endangered under CESA and ESA. Escapement in 1992 was estimated to be 1,180 fish, indicating good survival of the 1989 class. NMFS's data indicate that the population has increased during the late 1990s through 2001. In 1996, returning spawners numbered about 1,000 fish; and in 2001, returning adults were estimated to be 5,500 (Pacific Fishery Management Council 2002). Despite increased efforts to maintain and enhance the population of winter-run Chinook salmon by various entities, in their final listing determination of June 28, 2005, NMFS again found "that the Sacramento River winter-run Chinook salmon ESU in-total is in danger of extinction throughout all or a significant portion of its range" and concludes that the ESU continues to warrant listing as an endangered species under ESA (National Marine Fisheries Service 2005a).

Like other Chinook populations in the Central Valley, winter-run have declined in abundance since 2005, and the 10-year trend is negative. Recent escapement trends were marked by a general downward trend from an average of approximately 10,700 adults in 2001–2006 to an average of 2,400 adults in 2007–2011 and a low of 827 in 2011 (CalFish 2012). Average run size is associated with a low risk of extinction, but the most recent returns are associated with a moderate risk. In general, the proportion of hatchery fish from LSNFH has ranged from 5 to 10%, with an outlier of 20% in 2005. In 2010, the estimated hatchery escapement was about 12% (CalFish 2010). This is generally consistent with the USFWS goal to keep hatchery escapement to less than 20%. In perspective, the winter-run ESU has shown marked improvement over the critically low abundance and productivity in the 1980s–1990s. The rate of population growth or the cohort replacement rate has been negative through 2010, indicating that it is not self-sustaining. Winter-run Chinook in the Central Valley continue to be at high risk of extinction, and there is nothing to indicate that the risk has diminished (Williams et al. 2011). Longer term

reduction in risk will depend on whether the introduction of winter-run into Battle Creek is successful in establishing another population within the winter-run's historical range.

4.4.1.2 Life History

Winter-run Chinook salmon spend 1–3 years in the ocean. Adult winter-run Chinook salmon leave the ocean and migrate through the Sacramento–San Joaquin River Delta (Delta) into the Sacramento River from December through July, with peak migration in March (Moyle 2002). Adults spawn from mid-April through mid-August, with peak activity in May and June (Vogel and Marine 1991). Fry emerge from the gravel beginning in late June and continuing through October (Fisher 1994). The primary spawning habitat in the Sacramento River is above Red Bluff Diversion Dam (RBDD) at River Mile (RM) 243, although spawning has been observed downstream as far as RM 218 (National Marine Fisheries Service 2001). Spawning success below RBDD may be limited primarily by warm water temperatures (Hallock and Fisher 1985; Yoshiyama et al. 1998). Spawning and egg incubation do not occur in the study area (Moyle 2002).

Downstream movement of juvenile winter-run Chinook salmon begins in August, soon after fry emerge. The peak abundance of juveniles moving downstream at Red Bluff occurs in September and October (Vogel and Marine 1991). Juvenile Chinook salmon move downstream from spawning areas in response to many factors, which may include inherited behavior, habitat availability, flow, competition for space and food, and water temperature. The numbers of juveniles that move and the timing of movement are highly variable. Storm events and their resulting high flows and turbidity appear to trigger downstream movement of substantial numbers of juvenile Chinook salmon.

Winter-run Chinook salmon smolts (i.e., juveniles that are physiologically ready to enter seawater) may migrate through the Delta and San Francisco Bay to the ocean from November through May (Yoshiyama et al. 1998). The Sacramento River channel is the main migration route through the Delta. However, the Yolo Bypass also provides significant outmigration passage during higher flow events.

During winter in the Sacramento–San Joaquin system, juveniles rear on seasonally inundated floodplains. Sommer et al. (2001) found higher growth and survival rates of juvenile Chinook salmon reared on the Yolo Bypass floodplain than those that reared in the mainstem Sacramento River.

4.4.1.3 Factors Affecting Abundance

One of the main factors in the decline of winter-run Chinook salmon is habitat loss and degradation. On the Sacramento River, Shasta Dam blocked access to historical spawning and

rearing habitat. Other factors affecting abundance include the effects of reservoir operations on water temperature, drought effects, passage impediments, harvesting and fishing pressure, entrainment in diversions, contaminants, predation by non-native species, and interaction with hatchery stock (U.S. Army Corps of Engineers 2000).

In the Sacramento River, operation of the Central Valley Project (CVP) and State Water Project (SWP) influences river flow. Low flows can reduce habitat area and adversely affect water quality. The resulting warm water temperatures and low dissolved oxygen levels can stress incubating eggs and rearing juvenile winter-run Chinook salmon. Low flow may affect migration of juveniles and adults through increased water temperature or reduced velocity that slows downstream movement of juveniles. Low flow, in combination with diversions, may result in higher entrainment losses at the state and federal pumping plants in the south Delta (U.S. Army Corps of Engineers 2000).

In the Delta, flow drawn through the Delta Cross Channel (DCC) and Georgiana Slough transports some percentage of downstream migrating salmon into the central Delta. The number of juveniles entering the DCC and Georgiana Slough is assumed to be proportional to the flow volume diverted from the Sacramento River (California Department of Fish and Game 1987). Survival of juvenile Chinook salmon that are drawn into the central Delta is lower than survival of juvenile Chinook salmon that remain in the Sacramento River channel.

Factors such as levee construction and bank armoring have altered the critical habitat of winter-run Chinook salmon. These factors reduce floodplain habitat, change river bank substrate size, and decrease the amount of SRA cover and riparian habitat, which in turn, reduce habitat availability and quality (National Marine Fisheries Service 2006a)

4.4.1.4 Survey Results

Focused surveys for Sacramento River winter-run Chinook salmon were not conducted. However, it is well documented that winter-run Chinook salmon use the BSA as a migration corridor during upstream (adult) and downstream (juvenile) migration. In addition, juvenile winter-run Chinook salmon seasonally use the lower reaches of the Sacramento River for rearing while emigrating to the ocean. Spawning and egg incubation do not occur in the BSA (Moyle 2002).

The temporal occurrence and relative abundance of juvenile winter-run Chinook salmon in the BSA can be inferred based on the weekly trawl surveys of the Sacramento River at Sherwood Harbor (RM 55) as part of the Delta Juvenile Fish Monitoring Program (DJFMP) (U.S. Fish and Wildlife Service 2015b). Sherwood Harbor is located approximately 4.5 miles downstream of the BSA, and the trawls conducted by USFWS provide a consistent and reliable method for

observing the timing of occurrence and relative abundance of juvenile winter-run Chinook salmon in the BSA. USFWS uses a Kodiak trawl at Sherwood Harbor from December through March and switches to a mid-water trawl beginning in April.

From January 2005 through March 2015, winter-run size juvenile Chinook salmon were detected in the trawls from October through April, although most were detected in the trawls from November through March (Table 4-5).

Table 4-5. Number of Winter-Run Size Juvenile Chinook Salmon Captured by Trawl at Sherwood Harbor (RM 55) by Month (January 2005 through March 2015)

Month/ Year	2005	2006	2007	2008	2009	2010	2011	2012	2013[1]	2014	2015	Monthly Total[2]
Jan	25	4	2	22	1	1		2			3	57
Feb	17	19	53	9	14	7	3	2		45	2	169
Mar	7	37		1			3	24		23	1	95
Apr	1	5					5	1		3		15
May												0
Jun												0
Jul												0
Aug												0
Sep												0
Oct					3	2						5
Nov	30	2			2			48		2		84
Dec	38	38		1		7		26		13		123
Annual Total	118	105	55	33	20	17	11	103	0	86	NA	548

NA = Not applicable.
[1] No winter-run size juvenile Chinook salmon were captured by trawl surveys.
[2] 2015 data are excluded from total because data are incomplete.

Quantification of SRA cover habitat in the BSA was based on a combination of field observations (June 17, 2015) and interpretation of recent aerial photographs, by ICF biologists. USFWS defines *SRA cover* as "the unique, near-shore aquatic cover that occurs at the interface between a stream or river and adjacent woody riparian habitat" and is an essential component of salmonid habitat. Key features of SRA cover include the following.

- An adjacent bank composed of natural, often eroding substrate that supports overhanging riparian vegetation and vegetation that may protrude into the water.
- A stream channel with variable amounts of woody material and detritus, and variable water velocity and depth.

SRA cover is composed of two components: overhead cover and instream cover. Overhead cover consists of overhanging riparian vegetation that provides important stream shading and contributes leaf litter and insects to the stream. Instream cover consists of submerged woody material (exposed roots, branches, and trunks), aquatic plants, substrate (gravel, cobble, and

boulders), and undercut banks. These attributes provide high-value feeding areas, burrowing substrates, escape cover, and reproductive cover for numerous regionally important fish and wildlife species. (U.S. Fish and Wildlife Service 1992)

Table 4-6 shows the amount of SRA cover present along both banks of the Sacramento River in the BSA relative to the total bank length.

Table 4-6. Existing Shaded Riverine Aquatic Cover (Overhead Vegetation and Undercut Banks) in the Biological Study Area

River Bank	Existing Bank Length[a] (linear feet)	Existing Overhead Vegetation		Existing Undercut Bank[a] (linear feet)
		Bank Length[a] (linear feet)	Percent Bank Length[a]	
City of Sacramento	900	598	66%	0
City of West Sacramento	752	377	50%	0
Total	**1,652**	**975**	**59%**	**0**

[a] Within the limits of the biological study area.

4.4.1.5 Project Impacts

The following assessment addresses potential direct and indirect effects of the proposed project on special-status fish species, including listed species, and designated critical habitat (where applicable). Potential project effects on listed species and critical habitat include both short-term and long-term effects. Short-term effects include temporary construction-related impacts on fish and aquatic habitat that may last from a few hours to days (e.g., suspended sediment and turbidity, construction noise, artificial lighting). Long-term effects (addition of overwater structure, loss of aquatic habitat [substrate and water column], loss of SRA cover habitat) typically would last months or years, or would be permanent. These effects are generally due to physical alteration of important habitat attributes of the channel, shoreline, and adjacent bank. Short-term effects on listed fish species were evaluated qualitatively based on general knowledge of the impact mechanisms and species responses to construction actions. Long-term effects were measured in terms of the area and/or linear feet of artificial shade, aquatic habitat, and SRA cover habitat affected by the proposed project.

It should be noted that impacts on special-status fish species and designated critical habitat from project construction discussed below would be the same for all project roadway design alternatives and residential access alternatives, as the design and construction methods for the new bridge would be the same under all alternatives.

Pile Driving Noise

Impact pile driving is of particular concern because of the intensity of sounds and known occurrences of fish kills associated with impact pile driving (Popper and Hastings 2009). The

effects of pile driving noise on fish may include behavioral responses, physiological stress, temporary and permanent hearing loss, tissue damage (auditory and non-auditory), and direct mortality (Popper and Hastings 2009). In general, factors that may influence the magnitude of effects include species, life stage, and size of fish; type and size of pile and hammer; frequency and duration of pile driving; site characteristics (e.g., water depth); and distance of fish from the source of the underwater sound.

The primary source of underwater noise associated with the project would be driving the 200 16-inch piles with an impact hammer for the two in-water piers (i.e., piers 2 and 5) and two in-levee abutments (i.e., abutments 1 and 6) for the new bridge, the 160 16-inch piles for the temporary trestle and work platforms, the 60 16-inch piles for the bridge fender system, and the eight 16-inch spud piles for the barges (Figure 1-3). Additional sources of underwater noise associated with the project would occur during installation of the eight 108-inch steel casings for the two in-water piers (i.e., piers 3 and 4) for the lift span with a vibratory hammer and/or hydraulic-driven oscillator/rotator system, and installation and removal of temporary sheet piles with a vibratory hammer for the temporary cofferdams used to isolate the in-water construction areas for bridge piers 2 and 5. Only driving of piles with an impact hammer is expected to produce sound levels that could result in injury to fish.

Table 4-7 presents a summary of the pile driving assumptions used in the analysis, including assumptions related to pile location (e.g., structure location, land, in-water, in de-watered cofferdam), pile size and type (e.g., steel pipe, steel H pile, concrete), the number of piles to be installed (e.g., total and number per day), type of driver to be used (e.g., impact, vibratory, hydraulic driven oscillator/rotator system), estimated total pile strikes (e.g., per pile and day), sound attenuation (e.g., bubble curtain, dewatered cofferdam, none), and underwater sound level assumptions. Because a specific pile type has not been determined, Table 4-7 presents pile driving assumptions for all possible pile driving scenarios, including with and without sound attenuation (i.e., bubble curtain).

The assessment of underwater noise impacts on fish is based on the overlap of construction activities (timing, location, duration) with the spatial and temporal distribution of sensitive species and life stages (Tables 4-4, 4-5, and 4-9 through 4-14), as well as the expected fish behavior if encountering underwater noise. An important measure for reducing the potential exposure of fish populations to pile driving noise is the restriction of in-water impact pile driving activities to May 1 through November 30, a period when the abundance of special-status fish in the construction area is reduced (Measure 23).

Table 4-7. I Street Bridge Hydroacoustic Analysis. 7-13-15

Pile Location	Pile Diameter/ Type	Driver	Total Number of Piles to be Installed	Land or Water Installation	Piles per Day	Engineer's Estimate of Strikes per Pile	Total Strikes per Day	Attenuation (dB)	Underwater Sound Level Assumptions					Cumulative SEL at Reference Distance	Transmission Loss Constant	Distance (m) to Threshold			
																Onset of Physical Injury			Behavior
																Peak	Cumulative SEL dB		RMS
																dB	Fish ≥ 2 g	Fish < 2 g	dB
									Peak	SEL	RMS	Reference Distance (m)	Source for Sound Level Assumptions			206 dB	187 dB	183 dB	150 dB
Abutments 1 and 6	16-in diameter steel	Impact	100	Land	20	800	16000	0	198	171	183	10	Caltrans 2014. 20-inch steel pipe driven on land near the San Joaquin River.	213	15	<10	251	251	1,585
	16-in square precast concrete (alternative to 16-in diameter steel above)	impact	100	Land	20	800	16000	0	192	174	181	10	Caltrans 2014. 24-inch octagonal concrete pile driven at the Port of Oakland.	216	15	<10	398	398	1,166
Temporary trestle	16-in diameter steel	Impact	160	Water	20	800	16000	0	208	176	187	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River.	218	15	14	541	541	2,929
	16-in diameter steel	Impact	160	Water with attenuation system	20	800	16000	-5	203	171	182	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River. 5 dB attenuation assumed from bubble curtain or dewatered coffer dam.	213	15	<10	251	251	1,359
Temporary trestle	16-in H pile (alternative to 16-in diameter steel pile above)	Impact	160	Water	20	800	16000	0	195	170	180	10	Caltrans 2014. 15-inch steel H thick driven at Ballena Isle Marina.	212	15	<10	215	215	1,000
	16-in H pile (alternative to 16-in diameter steel pile above)	Impact	160	Water with attenuation system	20	800	16000	-5	190	165	175	10	Caltrans 2014. 15-inch steel H thick driven at Ballena Isle Marina. 5 dB attenuation assumed from bubble curtain.	207	15	<10	100	100	464
Piers 2 and 5	16-in diameter steel	Impact	100	Inside dewatered cofferdam	20	800	16000	-5	203	171	182	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River. 5 dB attenuation assumed from dewatered coffer dam.	213	15	<10	251	251	1,359
	16-in square precast concrete (alternative to 16-in diameter steel above)	Impact	100	Inside dewatered cofferdam	20	800	16000	-5	183	161	171	10	Caltrans 2014. 24-inch octagonal concrete pile driven at the Port of Oakland. 5 dB attenuation assumed from dewatered coffer dam.	203	15	<10	54	54	251

Pile Location	Pile Diameter/ Type	Driver	Total Number of Piles to be Installed	Land or Water Installation	Piles per Day	Engineer's Estimate of Strikes per Pile	Total Strikes per Day	Attenuation (dB)	Underwater Sound Level Assumptions					Cumulative SEL at Reference Distance	Transmission Loss Constant	Distance (m) to Threshold			
																Onset of Physical Injury			Behavior
																Peak	Cumulative SEL dB		RMS
																dB	Fish ≥ 2 g	Fish < 2 g	dB
									Peak	SEL	RMS	Reference Distance (m)	Source for Sound Level Assumptions			206 dB	187 dB	183 dB	150 dB
Bridge Fender System	16-in diameter concrete	Impact	60	Water	20	1000	20000	0	188	166	176	10	Caltrans 2014. 24-inch octagonal concrete pile driven at the Port of Oakland.	209	15	<10	117	117	541
	16-in diameter concrete	Impact	60	Water with attenuation system	20	1000	20000	-5	183	161	171	10	Caltrans 2014. 24-inch octagonal concrete pile driven at the Port of Oakland. 5 dB attenuation assumed from bubble curtain.	204	15	<10	54	54	251
Spud piles	16-in diamter steel	Impact	8	Water	8	800	6400	0	208	176	187	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River.	214	15	14	541	541	2,929
	16-in diamter steel	Impact	8	Water with attenuation system	8	800	6400	-5	203	171	182	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River. 5 dB attenuation assumed from bubble curtain.	209	15	<10	251	251	1,359
Piers 3 and 4	108-in steel casings	Vibratory hammer and/or hydraulic driven oscillator/rotator system	8	Water	2 weeks /pile	NA	NA	NA	Vibratory pile driving is not known to cause injury to fish and is therefore not evaluated here.										
									Hydraulic oscillator/rotator systems slowly rotate pile into place and do not generate high underwater noise levels.										

Note 1. Cofferdam sheet piles will be driven with a vibratory driver. Vibratory pile driving is not known to cause injury to fish and is therefore not evaluated.
Note 2. There is limited data available for concrete piles driven on land. Data taken from measurements at the Port of Oakland is used. In this case piles driven on land resulted in higher underwater sound levels than piles driven in water.
Note 3. Pile driving energy does not accumulate once the single strike SEL drops to 150 dB (i.e. "effective quiet"). The distance to the onset of physical injury therefore cannot extend beyond the distance to "effective quiet." Once the daily number of strikes exceeds 5,000 strikes per day the distance to the onset of injury does not increase.
For this reason the distances to the 183 dB and 187 dB thresholds are the same.

To further minimize direct effects on fish, the project proponent proposes to use sound attenuation measures—including cofferdam dewatering and, if feasible, bubble curtains—and hydroacoustic monitoring to minimize the exposure of special-status fish species to potentially harmful pile driving sounds (Measures 24 and 25). During in-water pile driving activities, the use of an impact driver will be limited to driving only the 16-inch piles that are needed for the piers and abutments of the new bridge, the temporary trestles, and the barges. All of the 108-inch steel casings will be installed with a vibratory hammer and/or hydraulic-driven oscillator/rotator system, and all of the temporary sheet piles for the cofferdams will be installed and extracted using a vibratory driver. Use of a vibratory driver and/or hydraulic-driven oscillator/rotator system to install the 108-inch steel casings and the vibratory driver to install and remove the temporary sheet piles for coffer dams is not expected to produce sound levels that result in injury to fish. Vibratory pile driving is a preferred method for minimizing the exposure of fish to potentially harmful pile driving sounds (National Marine Fisheries Service 2009b). Therefore, the following assessment focuses on the potential for injury to fish based on predicted noise levels associated with impact pile driving.

Injury Thresholds for Pile Driving Noise

The ability to predict impacts of pile driving noise on listed fish species is currently limited by a lack of information on the key variables and mechanisms linking pile driving sounds with the biological responses of the species of concern (Popper and Hastings 2009). Beginning in 2004, Caltrans—in coordination with the FHWA, Oregon Department of Transportation, and Washington Department of Transportation—established a Fisheries Hydroacoustic Working Group (FHWG) to coordinate and improve information related to the assessment of underwater noise impacts on fish from pile driving. Other member agencies include NMFS (West Coast Region [formerly Northwest and Southwest Regions]), USFWS, and CDFW.

The following assessment is based on application of interim noise criteria established by the FHWG in 2008 (Table 4-8). These criteria, based on recommendations developed by Popper at al. (2006) and revised by Carlson et al. (2007), are considered preliminary thresholds for assessing the potential for injury to listed fish species. The peak sound pressure level (SPL) is considered the maximum SPL a fish can receive from a single strike without injury. The cumulative sound exposure level (SEL) is considered the total amount of acoustic energy that a fish can receive from a single or multiple strikes without injury. Insufficient data are currently available to support the establishment of a noise threshold for behavioral effects (Popper et al. 2006); however, NMFS generally assumes that a noise level of 150 decibels root mean square (dB RMS) is an appropriate threshold for behavioral effects. Technical guidance on the application of these criteria to pile driving projects is presented by ICF Jones & Stokes and Illingworth and Rodkin (2009).

Table 4-8. Interim Criteria for Injury to Fish from Pile Driving Activities

Interim Criteria	Agreement in Principle
Peak sound pressure level (SPL)	206 dB re 1µPa (for all sizes of fish)
Cumulative sound exposure level (SEL)	187 dB re 1µPa^2-sec—for fish size ≥ 2 grams 183 dB re 1µPa^2-sec—for fish size < 2 grams
Behavioral (RMS)	150 dB re 1µPa (for all sizes of fish)

dB = decibel(s)
dB re 1µPa = dB referenced to a pressure of 1 microPascal
dB re 1µPa2-sec = dB referenced to a pressure of 1 microPascal squared per second
RMS = root mean square

The potential for physical injury to fish from exposure to pile driving sounds was evaluated using the "NMFS Pile Driving Calculator," a spreadsheet model developed by NMFS to calculate the distances from the pile that sound attenuates to the peak or cumulative criteria. These distances define the area in which the criteria are expected to be exceeded as a result of impact pile driving (potential impact area). The NMFS spreadsheet calculates these distances based on estimates of the single-strike sound levels for each pile type (measured at 10 meters [32.8 feet] from the pile) and the rate at which sound attenuates with distance. To account for the exposure of fish to multiple pile driving strikes, the model computes a cumulative SEL for multiple strikes based on the single-strike SEL and the number of strikes per day or pile driving event. Estimated single-strike sound levels were based on measured sound levels produced by similar piles (California Department of Transportation 2009). The standard sound attenuation rate of 4.5 dB per doubling of distance was used in the absence of other data. The estimated number of pile strikes per day was provided by the project engineers. Because juveniles of some species in the project area could be smaller than 2 grams, the cumulative SEL threshold of 183 dB (i.e., the more protective threshold) is used in this analysis. It should be noted, however, that because the estimated daily number of strikes per day exceeds 5,000 strikes, the distance to the onset of physical injury does not increase because pile driving energy does not accumulate once the single strike SEL drops to 150 dB (i.e., "effective quiet"); therefore, the distance to the 183 dB and 187 dB thresholds are the same (see "Note 3" at bottom of Table 4-7).

16-Inch Piles for Temporary Trestles

A total of 160 16-inch piles would be installed to support trestles for the work platforms during construction. The trestles would be installed over a 3 week period in May in the first year of construction and would remain in place throughout the duration of bridge construction (Figure 1-4). It was assumed that up to 20 piles (4–10 piles per day per pile driver, with two pile drivers operating) would be driven in a day, requiring up to 16,000 strikes with the impact hammer to drive and test each pile (Table 4-7). The piles for the temporary trestles would be removed during October of the second construction season once bridge construction is completed. Two pile types are being considered: 16-inch-diameter steel and 16-inch H piles. Both pile types have been evaluated separately for noise impacts.

Because bubble curtain feasibility and effectiveness have not been evaluated for installing the temporary trestle piles, the following results are for driving of piles without sound attenuation and represent a worst-case scenario for underwater sound levels. However, results for driving both pile types (i.e., 16-inch-diameter steel and 16-inch H piles) with sound attenuation (i.e., bubble curtain) are also shown in Table 4-7 for comparison, but are not discussed further.

16-Inch-Diameter Steel Piles for Temporary Trestles

Impact driving of 16-inch-diameter steel piles is expected to produce a single-strike peak SPL of 208 dB and a single-strike SEL of 176 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-7); the single-strike peak SPL exceeds the interim criteria (Table 4-8). Peak SPLs above the interim threshold (206 dB) would extend 14 meters (46 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile, with two pile drivers operating), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 541 meters (1,775 feet) away from the source pile.

16-Inch H Piles for Temporary Trestles

Impact driving of 16-inch H piles is expected to produce a single-strike peak SPL of 195 dB and a single-strike SEL of 170 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-7). The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-8). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile, with two pile drivers operating), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 215 meters (705 feet) away from the source pile.

16-Inch Piles for Piers 2 and 5

A total of 100 (50 per pier) 16-inch piles would be installed to construct piers 2 and 5 for the two fixed-span approach structures that would tie into the Sacramento and West Sacramento banks of the river (Figure 1-3). The 16-inch piles for piers 2 and 5 would be installed inside dewatered cofferdams that would be constructed to isolate the construction site from the Sacramento River. The piles would be driven over a 1 week period in May in the first construction season (Figure 1-4). It was assumed that up to 20 piles (4–10 piles per day per pile driver, with two pile drivers operating) would be driven in a day, requiring up to 16,000 strikes with the impact hammer to drive and test each pile (Table 4-7). Two pile types are being considered: 16-inch-diameter steel and 16-inch-square precast concrete piles. Both pile types have been evaluated separately for noise impacts.

16-Inch-Diameter Steel Piles for Piers 2 and 5

Impact driving of 16-inch H piles for piers 2 and 5 in the dewatered cofferdams is expected to produce a single-strike peak SPL of 203 dB and a single-strike SEL of 171 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-7).The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-8). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 251 meters (824 feet) away from the source pile.

16-Inch-Square Precast Concrete Piles for Piers 2 and 5

Impact driving of 16-inch-square concrete piles for piers 2 and 5 in the dewatered cofferdams is expected to produce a single-strike peak SPL of 183 dB and a single-strike SEL of 161 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-7).The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-8). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 54 meters (177 feet) away from the source pile.

16-Inch Piles for Abutments 1 and 6

A total of 100 (50 per abutment) 16-inch piles would be installed to construct abutments 1 and 6 on the West Sacramento and Sacramento banks of the river, respectively (Figure 1-3). The piles would be installed over a 1 week period in May of the second construction season (Figure 1-4). It was assumed that up to 20 piles (4–10 per day per pile driver, with two pile drivers operating) would be driven in a day, requiring up to 16,000 strikes with the impact hammer to drive and test each pile (Table 4-7). Two pile types are being considered: 16-inch-diameter steel and 16-inch-square precast concrete. Both pile types have been evaluated separately for noise impacts because of their proximity to the river.

16-Inch-Diameter Steel Piles for Abutments 1 and 6

Impact driving of 16-inch-diameter piles for abutments 1 and 6 is expected to produce a single-strike peak SPL of 198 dB and a single-strike SEL of 171 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-7). The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-8). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 251 meters (824 feet) away

from the source pile. Because the piles would be driven on land, there are no opportunities to attenuate noise levels.

16-Inch-Square Precast Concrete Piles for Abutments 1 and 6

Impact driving of 16-inch-square precast concrete piles for abutments 1 and 6 is expected to produce a single-strike peak SPL of 192 dB and a single-strike SEL of 174 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-7). The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-8). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 398 meters (1,306 feet) away from the source pile. Because the piles would be driven on land, there are no opportunities to attenuate noise levels.

16-Inch-Diameter Concrete Piles for Bridge Fender System

A total of 60 (30 per pier) 16-inch-diameter concrete piles would be installed at piers 3 and 4 to construct the bridge fender system for the two movable span piers (Figure 3-1). The fender system would protect the piers from errant watercraft navigating the river. The piles would be installed over a 2 week period in October of the second construction season (Figure 1-4). It was assumed that up to 20 piles per day (4–10 piles per day per pile driver, with two pile drivers operating) would be driven in a day, requiring up to 20,000 strikes with an impact hammer to drive and test each pile (Table 4-7).

Because bubble curtain feasibility and effectiveness have not been evaluated for installing the concrete piles for the bridge fender system, the following results are for driving of piles without sound attenuation and represent a worst-case scenario for underwater sound levels. However, results for driving the 16-inch-diameter concrete piles with sound attenuation (i.e., bubble curtain) are also shown in Table 4-7 for comparison, but are not discussed further.

Impact driving of 16-inch-diameter concrete piles for the bridge fender system is expected to produce a single-strike peak SPL of 188 dB and a single-strike SEL of 166 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-7). The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-8). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 20,00 strikes per day (20 piles per day at 1,000 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 117 meters (384 feet) away from the source pile.

16-Inch-Diameter Steel Piles for Barge Installation

A total of 8 16-inch-diameter steel piles (spud piles) would be installed to anchor each barge to provide a floating work platform during bridge construction. One to two barges would be used during construction and would be installed over a 1 week period in May of the first and second construction season. The barges would be in use for approximately 24 months and would be moved approximately 4–6 times during anytime of the year. It was assumed that up to 8 piles per day would be driven on the days a barge would be moved, requiring up to 6,400 strikes with an impact hammer to drive each pile (Table 4-7).

Because bubble curtain feasibility and effectiveness have not been evaluated for installing the spud piles for the barges, the following results are for driving of piles without sound attenuation and represent a worst-case scenario for underwater sound levels. However, results for driving the spud piles with sound attenuation (i.e., bubble curtain) are also shown in Table 4-7 for comparison, but are not discussed further.

Impact driving of 16-inch-diameter steel (spud) piles for the barges is expected to produce a single-strike peak SPL of 208 dB and a single-strike SEL of 176 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-7); the single-strike peak SPL exceeds the interim criteria (Table 4-8). Peak SPLs above the interim threshold (206 dB) would extend 14 meters (46 feet) from the source pile. Based on an assumed maximum rate of 6,400 strikes per day (8 piles per day at 800 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 541 meters (1,775 feet) away from the source pile.

108-Inch Steel Casings for Piers 3 and 4

A total of 8 (4 per pier) 108-inch steel casings would be installed to construct piers 3 and 4 for the tower foundations (Figure 1-3). The 108-inch steel casings for piers 3 and 4 would be installed with a vibratory pile driver and/or hydraulic-driven oscillator/rotator system; therefore, this method of installation would not generate high underwater noise levels (Table 4-7). It was assumed that it will take approximately 7 weeks to install both 108-inch steel casings. The 108-inch steel casings would be installed from late May through early July in the first construction season (Figure 1-4).

Sheet Piles for Temporary Cofferdams

Two cofferdams would be installed to construct piers 2 and 5 (Figure 1-3). The sheet piles for the cofferdams would be installed and removed with a vibratory pile driver; therefore, this method of installation and removal would not generate high underwater noise levels (Table 4-7). The sheet piles for the two cofferdams would be installed at the same time over a 2 week period in May of the first construction season (Figure 1-4).

Effects of Pile Driving Noise on Fish

The proposed timing of pile driving activities and, where feasible, use of sound attenuation measures are expected to minimize the exposure of listed fish species to potentially harmful pile driving sounds. Generally, the potential for injury or mortality of special-status fish species would be greatest for the 16-inch-diameter steel piles for the temporary trestles and the 16-inch-diameter steel piles for anchoring the barges driven in water (no attenuation) and would be the lowest for the 16-inch-square precast concrete piles for piers 2 and 5 driven in dewatered cofferdams. For the 16-inch-diameter steel piles for the temporary trestles and the 16-inch-diameter steel piles for anchoring the barges driven in water (unattenuated), the potential for injury and mortality would exist within areas of up to 14 meters (46 feet) for single-strike exposures and within areas of up to 541 meters (1,775 feet) of the source piles for multiple-strike exposures to impact pile driving sounds. By comparison, for 16-inch-square precast concrete piles for piers 2 and 5 driven in dewatered cofferdams, the potential for injury and mortality would still exist within areas of less than 10 meters (32.8 feet) of the source piles for single-strike exposures and within areas of up to 54 meters (177 feet) of the source piles for multiple-strike exposures to impact pile driving sounds.

Several factors that could influence the potential exposure and susceptibility of fish to injury from pile driving sounds include the size, mobility, and likely responses of the species and the life stages of concern. Large, actively migrating adults and juveniles are capable of readily avoiding or migrating through the areas where potential injury may occur. In addition, because of their large size (>600 mm [24 inches]), adult salmonids and green sturgeon would be expected to tolerate higher sound pressures than the levels associated with the onset of injury in smaller fish (Table 4-8), such as juvenile salmonids and species whose individuals are relatively small (e.g., delta and longfin smelt). At a minimum, any adults or juveniles encountering pile driving noise may exhibit some form of behavioral response, including an avoidance response that could disrupt or delay their movement or feeding. Evidence suggests that some fish species avoid or disperse from areas subject to pile driving or other human-generated noises (Popper and Hastings 2009).

Installation of the temporary trestle piles and piles for piers 2 and 5 in May of the first year of construction presents the greatest concern for the potential of injury and mortality of fish from pile driving noise because of the relatively large number of piles (i.e., approximately 160 total piles) that would be installed and the relatively large channel area that would be subject to cumulative sound levels exceeding the injury thresholds (Table 4-7). In addition, relocation of the construction barges is of concern if impact driving is required to install the spud piles to anchor the barges during primary periods of species and life stage occurrence. However, unlike pile driving associated with the temporary trestles and bridge piers, pile driving associated with

relocation of the barges would be infrequent (4–6 times over the course of construction) and would require that only 8 piles be driven over the course of one day, per event.

Winter-run, spring-run, fall-run, and late fall–run Chinook salmon, steelhead, green sturgeon, and river lamprey eggs and fry would not be exposed to underwater noise from pile driving activities because these activities are located well downstream of spawning areas or because these life stages would not be present during the proposed in-water construction period. Some overlap with green sturgeon and winter-run and spring-run Chinook salmon adults may occur at the end of the migration season in May and June, with late fall–run Chinook salmon and steelhead adults at the beginning of the migration season in November, and with steelhead and river lamprey adults in November. Adult fall-run Chinook salmon may be exposed to underwater noise from pile driving activities in early July and November, and some fall-run and spring-run Chinook salmon and steelhead smolts may be exposed to underwater noise from pile driving in May and June.

Unlike anadromous salmonids, green sturgeon, and lamprey that spawn well upstream of the BSA, delta and longfin smelt, and splittail may spawn within or in the vicinity of the BSA; therefore, their eggs and larvae may be exposed to underwater noise from pile driving activities. In addition, pile driving activities would overlap with delta smelt, longfin smelt, and Sacramento splittail adults at the end of the migration and spawning season in May and June, and with larvae and juveniles of these species in May through early July. Pile driving associated with relocating the construction barges outside of May 1 to November 30 could potentially overlap peak migration and spawning periods for special-status fish species; however, because it is not known when barges would have to be moved it is not possible to identify which species and life stages potentially would be affected. However, these pile driving activities would be infrequent and last for less than one day per event.

Based on the predicted levels of underwater noise, pile driving activities could lead to injury and/or direct and indirect mortality if individuals are within the range of noise levels that could cause physical harm or behavioral effects that lead to mortality (e.g., from predation). However, it is likely that only a small proportion of each fish population is at risk, based on the relatively limited overlap of pile driving activities with migration timing.

Although pile driving would occur over many days per season, pile driving will not be continuous and will be limited to daylight hours only, resulting in extended overnight periods each day for migrating fish to pass the construction site undisturbed. In addition, the project proponent proposes to drive piles for in-water piers 2 and 5 in dewatered cofferdams and to install the 108-inch-diameter steel casings for in-water piers 3 and 4 using a vibratory hammer and/or hydraulic driven oscillator/rotator system, which would not generate the same underwater

noise levels had these piles been driven in water with an impact hammer. Finally, the project proponent will require the contractor to employ sound attenuation devices (e.g., bubble curtains) during in-water pile driving, if feasible.

Insufficient data are currently available to support the establishment of a noise threshold for behavioral effects (Popper et al. 2006). NMFS generally assumes that a noise level of 150 dB RMS is an appropriate threshold for behavioral effects. During in-water (no attenuation) impact driving of the 16-inch piles for the trestles and barges, the spreadsheet calculations indicate that underwater sounds exceeding 150 dB RMS would extend 2,929 meters (1.8 miles) from the source piles (Table 4-7). However, these calculations assume an unimpeded open water propagation path over this distance, which is not the case for the Sacramento River. The Sacramento River has major river channel bends within about 1,280 meters (4,200 feet) upstream and 1,830 meters (6,000 feet) downstream from the proposed bridge crossing that will result in diffraction and attenuation of sound waves. Thus, the distance within which 150 dB RMS is exceeded likely would be less than indicated in Table 4-7.

Based on the area of disturbance and timing of pile driving operations, some disturbance to the movement and feeding of special-status fish is anticipated. In addition, pile driving activities would not be continuous but would start and stop during the course of each day of pile driving (including cessation of pile driving activities at night), providing opportunities for fish to continue with their movements and feeding without substantial delays. In addition, general construction noise may act to disperse fish away from the construction area before impact driving is initiated.

Increased Exposure to Contaminants

Disturbance and resuspension of river bottom sediments during in-water construction pose a risk to juvenile and adult winter-run Chinook salmon because of potential increases in the exposure to contaminated sediments.

Sand, silt, and gravel characterize bottom substrate in the BSA. Non-soluble contaminants with a tendency to adsorb[1] to sediments (as opposed to soluble contaminants which have the tendency to be readily diluted in water) can accumulate in the substrate over time. Non-soluble contaminants that are known to be present in the Sacramento River include polychlorinated biphenyls (PCBs), mercury, pesticides and insecticides (i.e., dieldrin, chlorodane, DDT), and other unknown toxicities (State Water Resources Control Board 2011). Resuspension of sediments with adsorbed metals during in-water construction potentially could lead to degradation of water quality and food resources in the BSA. In addition, resuspended particulate

[1] *Adsorption* is the adhesion of atoms, ions, or molecules from a gas, liquid, or dissolved solid to a surface—in this case, a sediment particle.

material could be transported to other locations in the Sacramento River as a result of transport by river currents, thus leading to potential degradation of water quality and food resources beyond the BSA. Although special-status fish species may be present in the BSA during any month, restricting in-water construction to the May 1–November 30 window will minimize or avoid exposure of most juvenile and adult winter-run Chinook salmon to contaminants because they occur less frequently in the Sacramento River during this time of year (Tables 4-4 and 4-5). Green sturgeon may be more susceptible than other fish species to contaminated sediments because they are more benthic oriented than other species and therefore may come into direct contact with contaminated sediments through ingestion of sediments along with benthic food organisms. In addition, their long life span allows them to accumulate high body burdens of contaminants, which potentially can reach concentrations with deleterious physiological effects.

In-water construction would be limited to pile driving and installation and removal of sheet piles for cofferdams. In addition, in-water construction would be limited to daylight hours each day. Thus, disturbance of channel substrate and the potential for increased contaminants would be temporary and localized. Assuming that mobilization of sediment is also an indication of contaminant mobilization, the proposed in-water construction methods should minimize the increase in contaminants.

Given the relatively short exposure time and the restricted area of in-water construction relative to the distribution and temporal occurrence of adult and juvenile winter-run Chinook salmon between May 1 and November 30, the effect of contaminants mobilized by in-water construction is not expected to result in significant effects to the survival and growth of winter-run Chinook salmon.

Contaminant Spills

Construction activities that occur in or near the Sacramento River channel can result in the discharge of contaminants that are potentially lethal to fish. The operation of heavy equipment, cranes, pile drivers, drilling rigs, tug boats, and other construction equipment during bridge construction can result in spills and leakage of fuel, lubricants, hydraulic fluids, and coolants. Other sources of potential contamination include asphalt, wet concrete, and other materials that may come into direct contact with surface water during construction activities. For example, concrete that is being poured for the bridge decking could be discharged accidentally to the river, thereby contaminating the river with uncured concrete (which can raise pH) and related compounds.

The potential magnitude of biological effects resulting from contaminants depends on a number of factors, including the proximity of spills to the river; the type, volume, concentration, and solubility of the contaminant; and the timing and duration of the spill or release of the

contaminant into the water column. Contaminants can affect survival, growth, and reproductive success of fish and other aquatic organisms. The level of effect depends on the species, life stage sensitivity, duration of exposure, condition or health of exposed individuals, and the physical and chemical properties of the water (e.g., temperature, pH, dissolved oxygen, and other factors).

Implementation of Measure 5 would eliminate or minimize the risk of contaminant spills and the potential effects of any spills on fish and other aquatic organisms.

Erosion and Mobilization of Sediment

Site clearing, earthwork, driving of permanent piles, driving and removal of piles for the temporary trestles, vibrating and removal of sheet piles for cofferdams, and installation of RSP will result in disturbance of soil and riverbed sediments, resulting in temporary increases in turbidity and suspended sediments in the Sacramento River. In addition, dewatering and soil removal from the inside of the cofferdams could result in temporary increases in turbidity and suspended sediments in the river, if water (and associated spoils) from within the cofferdams is not properly disposed of or contained and treated before being discharged back to the river.

The potential for disturbance of riverbed sediments and associated increases in sedimentation and turbidity in the Sacramento River are anticipated to be greatest during activities to extract the piles used for the temporary trestles and cofferdams. These activities would result in greater disturbance to riverbed sediments than would occur during pile driving for piers and the bridge fender system; these piles would be driven only and not extracted.

In addition to increasing exposure to contaminants as discussed previously, elevated levels of suspended sediments have the potential to result in physiological, behavioral, and habitat effects related to increased sediment concentrations in the water column. The severity of these effects depends on the sediment concentration, duration of exposure, and sensitivity of the affected life stage. Short-term increases in turbidity and suspended sediment may disrupt normal behavior patterns of fish, potentially affecting foraging, rearing, and migration. The level of disturbance may also cause juveniles to abandon protective habitat or reduce their ability to detect predators, potentially increasing their vulnerability to predators (e.g., striped bass and largemouth bass). Previous studies have documented these effects. For example, juvenile salmonids have been observed to avoid streams that are chronically turbid (Lloyd et al. 1987) or move laterally or downstream to avoid turbidity plumes (Sigler et al. 1984). Bisson and Bilby (1982) reported that juvenile coho salmon avoid turbidities exceeding 70 nephelometric turbidity units (NTUs). Chronic exposure to high turbidity and suspended sediment may affect growth and survival by impairing respiratory function, reducing tolerance to disease and contaminants, and causing physiological stress (Waters 1995). Sigler et al. (1984) found that prolonged exposure to turbidities between 25 and 50 NTUs resulted in reduced growth and increased emigration rates of

juvenile coho salmon and steelhead compared to controls. Increased sediment delivery can also smother aquatic invertebrates (a fish food item), degrade forage habitat, and reduce cover for juvenile fish.

Green sturgeon may be at higher risk of exposure to construction-related impacts than other listed species because their benthic nature may make them more likely to encounter sediment plumes that may be more concentrated near the river bottom.

Implementation of Measure 5 would eliminate or minimize the potential for mobilization of sediment and increased sedimentation and turbidity in the Sacramento River. Some harassment of adult and juvenile fish may occur due to temporary, localized plumes of sediment during pile driving and installation and removal of temporary piles and sheet piles. Turbidity would be monitored throughout in-water construction (Measure 26).

Increases in Impervious Surface Area and Storm Water Runoff

The proposed project would result in added impervious surface which would have the potential to increase runoff volume in the Sacramento River. Increased traffic loads on the new bridge resulting from improved access could result in increased deposition of particulates onto the bridge deck that could then be transported to the Sacramento River with road runoff.

Heavy metals, oil, grease, and polycyclic aromatic hydrocarbons (PAHs) are common pollutants in road runoff;. Some of these pollutants can accumulate in stream sediments with lethal and sublethal consequences for fish and other aquatic species, particularly during “first flush” rain events. PAHs are organic compounds—containing only carbon and hydrogen—that occur in motor vehicle exhaust, petroleum products, materials associated with asphalt, and various other municipal and industrial sources. PAHs are widely distributed in the environment and are important environmental pollutants because of their carcinogenicity and tendency to bioaccumulate. PAHs are readily absorbed by fish and other aquatic organisms and, depending on concentration, can lead to lethal and deleterious sublethal effects in these organisms (Tuvikene 1995). PAHs tend to adsorb to any particulate matter, including fine sediment; therefore, relative concentrations of PAHs in aquatic ecosystems are generally highest in sediments, followed by aquatic biota and the water column (Tuvikene 1995). There is evidence that urban runoff containing roadway sediment may be an important PAH input to aquatic habitats and that a significant contribution to the PAH content of roadway sediment comes from materials associated with asphalt (Wakeham et al. 1980).

Although the new bridge would represent added impervious surface area, the proposed project would not represent a substantial increase in impervious surface area in the BSA relative to existing conditions. The new bridge would replace the vehicle portion of the existing I Street

Bridge, and existing traffic would be re-routed to the new bridge. In addition, storm water runoff from the new bridge would be directed to the existing storm water collection systems. Therefore, it is not anticipated that the proposed project would contribute to a cumulative water quality impact during operations.

Temporary and Permanent Loss of Aquatic Habitat

The proposed project would result in the temporary and permanent loss of aquatic habitat area and volume, including foraging and rearing habitat for juvenile winter-run Chinook salmon. Table 4-9 shows the temporary and permanent loss of aquatic habitat that would occur as a result of constructing the proposed project.

Table 4-9. Amount of Temporarily and Permanently Affected Aquatic Habitat in the Sacramento River Resulting from the Proposed Project

Feature/Habitat	Temporary Impact	Permanent Impact
Temporary Cofferdams		
Substrate Area (square feet [acre])	4,000 [0.09]	NA
Water Column Volume (cubic feet)	73,640	NA
Temporary Trestle Piles		
Substrate Area (square feet [acre])	197 [0.005]	NA
Water Column Volume (cubic feet)	3,573	NA
Piers 2 and 5		
Substrate Area (square feet [acre])	NA	8,500 [0.20][1]
Water Column Volume (cubic feet)	NA	12,250
Piers 3 and 4		
Substrate Area (square feet [acre])	NA	1,864 [0.04][2]
Water Column Volume (cubic feet)	NA	17,800
Piles for Bridge Fender System		
Substrate Area (square feet [acre])	NA	85 [0.002]
Water Column Volume (cubic feet)	NA	2,600
Shoreline Rock Revetment (RSP)		
Substrate Area (square feet [acre])	**NA**	**70,000 [1.61]**
Water Column Volume (cubic feet)	**NA**	**NA**
TOTALS		
Substrate Area (square feet [acre])	4,197 [0.095]	80,449 [1.85]
Water Column Volume (cubic feet)	77,213	32,650

NA = Not applicable
[1] 2,500 sf (pile caps) + 6,000 sf (RSP)
[2] 64 sf (piles) + 1,800 sf (RSP)

Installation of sheet pile cofferdams to isolate the in-water construction areas for piers 2 and 5 from the water column during pier construction would result in the temporary loss of aquatic habitat (substrate and water column) equal to the enclosed area and volume of the in-water cofferdams. The proposed dimensions of each cofferdam are 25 feet by 80 feet, or 2,000 square feet. Together, the two cofferdams would result in a temporary loss of 4,000 square feet (0.09 acre) of substrate habitat and up to 73,640 cubic feet of water column habitat below the OHWM (based on a water surface elevation of +20 feet). Similarly, installation of piles for the

temporary trestles would also result in the temporary loss of substrate and water column habitat equal to the total area and volume of the in-water piles used to support the temporary trestles. The temporary trestle piles would remain in place throughout the duration of construction. A total of approximately 141 16-inch-diameter pipe or H piles would be installed below the OHWM to support the temporary trestles, and would result in a temporary loss of 197 square feet (0.005 acre) of substrate habitat and up to 3,573 cubic feet of water column habitat below the OHWM. (Approximately 19 of the 160 piles for the temporary trestles would be installed above the OHWM).

Installation of the new bridge piers (piers 2–5) and piles for the new bridge fender system would result in the permanent loss of aquatic habitat (substrate and water column) equal to the cumulative area (substrate) and volume (water column) of the in-water piers and bridge fender piles. Similarly, placement of rock revetment (rip-rap) around the new bridge piers and on the waterside slope of the existing levees below the OHWM also would result in the permanent loss of natural substrate habitat equal to the net increase in area of rock revetment. Up to 1,600 linear feet of shoreline (900 linear feet on City of Sacramento shoreline and 700 linear feet on City of West Sacramento shoreline), covering up to 70,000 square feet (1.61 acre) of the bank below the OHWM, would be lined with RSP (1/4-ton, Method B). A total of 2,000 cubic yards of RSP would be placed below the OHWM, and a total of 2,000 cubic yards would be placed above the OHWM.

Installation of these features may result in direct and indirect effects by inhibiting establishment of riparian vegetation; inhibiting recruitment and retention of sediment and woody debris; and eliminating shallow, low-velocity river margins preferred by juvenile fish.

Compensation for impacts on critical habitat, as described below, would offset the effects of permanent impacts on the substrate and water column resulting from construction of the new bridge piers.

Loss of Shaded Riverine Aquatic Cover

Clearing of the existing cottonwood riparian forest vegetation within the proposed project footprint would result in the permanent loss of up to 1.44 acres and temporary loss of up to 1.52 acres of cottonwood riparian forest within the BSA, of which approximately 0.44 acres is below the OHWM and contributes to overhead (shade) and instream SRA cover (see additional discussion below regarding SRA cover). The permanent loss of existing cottonwood forest would result from activities related to construction of the two fixed-span bridge approach structures, the bikeway along Jibboom Street in the City of Sacramento, and the new residential access road connecting B Street and 3rd Street in the City of West Sacramento (Figure 3-1). The temporary loss of cottonwood riparian forest would occur from trimming riparian vegetation and

removing additional trees and understory vegetation to provide equipment access. Portions of this affected riparian forest also provide SRA cover habitat that is an important component of anadromous fish habitat (see additional discussion below). Clearing of the existing cottonwood riparian forest that contributes to SRA cover would result in the temporary and permanent loss of up to 890 linear feet (i.e., up to 513 linear feet on the City of Sacramento side of the Sacramento River and up to 377 linear feet on the City of West Sacramento side of the Sacramento River) of overhead SRA cover (shade) along the summer (low-flow) shoreline of the Sacramento River.

Riparian vegetation is important in controlling stream bank erosion, contributing to instream structural diversity, and maintaining undercut banks. In addition, canopy cover (overhanging vegetation [a form of SRA cover]) maintains shade that is necessary to reduce thermal input and provides an energy input to the aquatic habitats in the form of fallen leaves and insects (a food source for fish). SRA cover also provides fish with protection from predators in the form of undercut banks, branches, roots, and instream woody material (e.g., logs).

Without appropriate mitigation, removal of streamside vegetation is likely to adversely affect winter-run Chinook salmon and other fish species because riparian and SRA cover habitat are essential components of salmonid rearing habitat that may limit production and abundance of salmonids in the Sacramento River. Salmonid populations are highly influenced by the amount of available cover (Raleigh et al. 1984). The amount of existing riparian and SRA cover habitat in the BSA and in the region is of variable quality because of past and ongoing impacts, including levee construction and bank protection activities (i.e., placement of rock revetment).

USFWS mitigation policy identifies California's riparian habitats, including SRA cover habitat, in Resource Category 2. The designation criteria for habitat in Resource Category 2 is "habitat to be impacted is of high quality for evaluation species and is relatively scarce or becoming scarce on a national basis or in the ecoregion section" (U.S. Fish and Wildlife Service 2015c), for which "no net loss of in-kind habitat value" is recommended (46 FR 7644, January 23, 1981). In addition, NMFS recommends re-vegetating onsite at a 3:1 ratio (3 units replaced for every 1 unit of affected habitat) with native riparian species to facilitate the development of SRA cover habitat (Rea pers. comm.).

Temporary and permanent impacts on riparian and SRA cover habitat will be compensated for by implementing Measure 4, discussed above.

Increase in Overwater Structure (Artificial Shade)

Overwater structures can alter underwater light conditions and provide potential holding conditions for juvenile and adult fish, including species that prey on juvenile fishes. Temporary shading attributable to the presence of the temporary trestles, work platforms, and barges during

bridge construction and permanent shading from the new bridge potentially could reduce primary productivity of affected habitats. Temporary shading also could increase the number of predatory fishes (e.g., striped bass, largemouth bass) holding in the study area and/or their ability to prey on juvenile fishes. Because the temporary trestles, work platforms, and barges would be present only during construction, effects of trestle, work platform, and barge shading would be temporary and localized.

Barge shading would occur year-round during construction of the new bridge. One to two barges, each approximately 60 feet wide and 190 feet long (11,400 square feet [0.26 acre]), would be present during construction and would provide a total of 11,400–22,800 square feet (0.26–0.52 acre) of temporary over-water structure (Table 4-10). Because the barges would be present only during construction and moved periodically as construction of the bridge progresses, effects of barge shading would be temporary and localized.

Table 4-10. Amount of Artificial Overwater Structure (Shade) on the Sacramento River under Existing and With-Project Conditions

Overwater Structure	Square Feet of Shaded Area		
	Existing Conditions	With-Project Conditions (Barge/Trestle/Bridge)	Change
Barge (Temporary)	0	11,400–22,800[a]	+11,400–22,800[a]
Trestle (Temporary)	0	30,000	+30,000
Bridge (Permanent)	0	55,000	+55,000
Net Change (Temporary)			+41,400–52,800a
Net Change (Permanent)			+55,000

NA = Not Applicable.
[a] 1 barge–2 barges.

Shading by the temporary trestles and work platforms would occur year-round during construction of the new bridge. Two trestles, approximately 30 feet wide and varying in length and configuration (Figure 1-3), would be present during construction and would provide a total of approximately 30,000 square feet (0.69 acre) of temporary over-water structure (Table 4-10). Because the trestles and work platforms would be present only during construction, effects of trestle shading would be temporary and localized. Together, the barges and temporary trestles would create up to 52,800 square feet (1.21 acres) of temporary overwater structure (i.e., shade) (Table 4-10).

The new bridge would create approximately 55,000 square feet (1.26 acre) of permanent over-water structure where no over-water structure currently exists. The increased shading created by the new bridge could potentially affect the migration of adult and juvenile winter-run Chinook salmon, and other species. Within the Sammamish River, in Washington State, migrating adult salmon hold in shaded areas beneath bridges (Carrasquero 2001). Juvenile salmonids also prefer shaded areas created by bridges. Because of the height of the new bridge over the water, ambient

light levels generally would be expected to penetrate into the water, thereby minimizing the effect of bridge shading on aquatic habitats in the Sacramento River. Compensation for impacts on critical habitat, as described below, would offset the effects of bridge shading on aquatic habitats in the Sacramento River.

Fish Entrapment in Cofferdams

Cofferdams will be required in order to construct piers 2 and 5 for the new bridge. Cofferdams will be constructed of sheet piles; when installed, each cofferdam will be approximately 25 feet wide and 80 feet long. The potential exists for entrapment and mortality of fish following closure and dewatering of the cofferdam. The proposed timing of cofferdam installation (May) would avoid the primary period of occurrence of juvenile winter-run Chinook salmon; however, the potential would remain for some special-status fish species to become entrapped in the cofferdams. Implementation of Measures 27 and 28 would further minimize or avoid the risk of mortality for fish potentially stranded during cofferdam installation, closure, and dewatering.

Introduction of Aquatic Invasive Species

During construction, the operation of barges and other in-water equipment originating from regions or areas outside the project area could result in the introduction and spread of aquatic invasive species (AIS), including the Asian overbite clam (*Corbula amurensis*), quagga mussel (*Dreissena bugensis*), zebra mussel (*Dreissena polymorpha*), hydrilla (*Hydrilla verticillata*), and Brazilian elodea (*Egeria densa*) (California Department of Fish and Game 2008). These species can adversely affect native fishes and other ecologically and economically important species through a number of mechanisms, including competition for resources, predation, parasitism, interbreeding, disease transmission, or changes in the physical or chemical attributes of aquatic habitat. The project proponent will address this impact by implementing Measure 29.

Increase in Direct Lighting on Sacramento River

Temporary lighting of work areas to facilitate nighttime construction, especially at construction sites adjacent to or over the Sacramento River, and permanent lighting associated with the new bridge may result in increased nighttime light intensity on the water surface of the Sacramento River. Increases in direct lighting of the Sacramento River at night may affect the migratory behavior of juvenile fish; alter behavior of animals that prey on fish (e.g., piscivorous birds, mammals, and fish) in adjacent and affected habitats; or make juvenile fish more visible to predators, thereby leading to increased mortality of fish through increased predation (Tabor et al. 2001). Implementation of Measure 30 would minimize the potential for effects of lighting on fish by requiring shielding and focusing of temporary lights on work areas and permanent bridge lighting to avoid and minimize the amount of nighttime lighting that directly radiates on streams, to the extent practicable.

The proposed project is *likely to adversely affect* winter-run Chinook salmon based on temporary effects on water quality (increased turbidity and suspended sediment), rearing and movement habitat (noise and shade), and channel substrates (cofferdams and temporary trestles); temporary and permanent effects on riparian and SRA cover habitat (vegetation removal, bridge and bike path construction) and permanent effects on aquatic habitat (construction of bridge piers, shade, and placement of RSP) in the Sacramento River.

Impacts on Sacramento River Winter-Run Chinook Salmon Critical Habitat

The Sacramento River within the BSA is included in the designated critical habitat for Sacramento River winter-run Chinook salmon (58 FR 33212–33219, June 16, 1993). The primary constituent elements of critical habitat in the BSA include freshwater rearing habitat with water quantity and quality, natural cover, forage, and passage conditions supporting migration and rearing of winter-run Chinook salmon. Critical habitat for winter-run Chinook salmon in the BSA includes the river water column, river bottom, and adjacent riparian zone—up to the ordinary or mean high water elevation—which is used by adults for migration and juveniles for rearing.

The project is *likely to adversely affect* Sacramento River winter-run Chinook salmon designated critical habitat. Impacts on winter-run Chinook salmon critical habitat include temporary effects on the water column (underwater noise and sound pressure, and water quality impacts) and channel substrate (cofferdams and trestles), and permanent loss of aquatic habitat (water column and substrate) and riparian and SRA cover habitat in the Sacramento River. These impacts would be the same as those discussed above for winter-run Chinook salmon.

With implementation of Measures 1–3, 5, 23–26, 29, and 30, impacts on winter-run Chinook salmon critical habitat would be avoided or minimized. In addition, impacts on riparian habitat would be compensated for by implementing Measure 4, while impacts on perennial stream would be compensated for by implementing Measure 7.

NMFS recommends the purchase of channel enhancement credits at a 3:1 ratio at a NMFS-approved anadromous fish conservation bank for the acres of impacted critical habitat within the river channel resulting from the proposed project (Rea pers. comm.). Measure 31 would be implemented to compensate for effects to critical habitat (see “Compensatory Mitigation” below).

4.4.1.6 Avoidance and Minimization Efforts

Implementation of the following measures would avoid and/or minimize direct and indirect impacts on Sacramento River winter-run Chinook salmon and their designated critical habitat.

Measure 1: Install Orange Construction Fencing between the Construction Area and Adjacent Sensitive Biological Resources

Please refer to the discussion of Measure 1 in Section 4.1.1.3.

Measure 2: Conduct Environmental Awareness Training for Construction Employees

Please refer to the discussion of Measure 2 in Section 4.1.1.3.

Measure 3: Conduct Periodic Biological Monitoring

Please refer to the discussion of Measure 3 in Section 4.1.1.3.

Measure 5: Protect Water Quality and Prevent Erosion and Sedimentation in Drainages and Wetlands

Please refer to the discussion of Measure 5 in Section 4.1.2.3.

Measure 23: Conduct All In-Water Construction Activities between May 1 and November 30 and during Daylight Hours Only

The project proponent will conduct all in-water construction work and pile driving (in-water and shore-based within 250 feet of the Sacramento River), installation of cofferdams, removal of temporary sheet piles, and placement of rock revetment between May 1 and November 30 to avoid or minimize causing disturbance and injury to, or mortality of, special-status fish species in the affected reaches of the Sacramento River. In addition, in-water work will be conducted during daylight hours only to provide fish in the affected reaches of the Sacramento River with an extended quiet period during nighttime hours for feeding and unobstructed passage.

Limiting in-water construction to the May 1–November 30 period would achieve several goals.

- In-water construction activities with the potential to generate harmful levels of underwater noise (e.g., driving piles with an impact hammer) would avoid the primary migration periods of adults and juveniles of special-status fish species.
- The length of the in-water construction period would be maximized, thereby limiting the number of construction seasons that in-water construction would be needed and the number of year classes of fish species that potentially would be exposed to in-water construction effects.

Measure 24: Implement Measures to Minimize Exceedance of Interim Threshold Sound Levels during Pile Driving

The project proponent will require the contractor to implement the following measures, developed in coordination with project design engineers, to minimize the exposure of listed fish species to potentially harmful underwater sounds.

- If feasible, the contractor will vibrate all piles to the maximum depth possible before using an impact hammer.
- No more than 20 piles will be driven per day, and pile driving with an impact hammer will occur on no more than 75 individual days total during construction.
- During impact driving, the contractor will limit the number of strikes per day to the minimum necessary to complete the work and will limit the total number of hammer strikes to 16,000 strikes per day (i.e., 800 hammer strikes per pile, per day) for piles for the bridge piers and temporary trestles, and 20,000 strikes per day (i.e., 1,000 hammer strikes per pile, per day) for the piles for the bridge fender system.
- The smallest pile driver and minimum force necessary will be used to complete the work.
- During impact driving, the project proponent will require the contractor to use a bubble curtain or similar device, if feasible, to minimize the extent to which the interim peak and cumulative SEL thresholds are exceeded (see Section 4.4.1.3, “Project Impacts”).
- No pile driving activity will occur at night, thereby providing fish with an extended quiet period during nighttime hours on days pile driving is being conducted for feeding and unobstructed passage.

Measure 25: Develop and Implement a Hydroacoustic Monitoring Plan

The project proponent and/or its construction contractor will develop and implement a hydroacoustic monitoring plan. The monitoring plan will be submitted to the resource agencies (CDFW, NMFS, and USFWS) for approval at least 60 days before the start of project activities. The plan will include the following requirements.

- The project proponent and/or its construction contractor will monitor underwater noise levels during all impact pile driving activities on land and in water to ensure that that peak and cumulative SELs do not exceed estimated values (Table 4-7).
- The monitoring plan will describe the methods and equipment that will be used to document the extent of underwater sounds produced by pile driving, including the number, location, distances, and depths of the hydrophones and associated monitoring equipment.
- The monitoring plan will include a reporting schedule for daily summaries of the hydroacoustic monitoring results and for more comprehensive reports to be provided to the resource agencies on a monthly basis during the pile driving season.

- The daily reports will include the number of piles installed per day; the number of strikes per pile; the interval between strikes; the peak SPL, SEL, and RMS per strike; and the accumulated SEL per day at each monitoring station.
- The project proponent or its contractors will ensure that a qualified fish biologist is on site during impact pile driving to document any occurrences of stressed, injured, or dead fish. If stressed, injured, or dead fish are observed during pile driving, the project proponent and/or its construction contractor will reduce the number of strikes per day to ensure that fish are no longer showing signs of stress, injury, or mortality.

Measure 26: Monitor Turbidity in the Sacramento River

The project proponent will require the construction contractor to monitor turbidity levels in the Sacramento River during in-water construction activities (e.g., pile driving, extraction of temporary sheet piles used for cofferdams, placement of RSP). Turbidity will be measured using standard techniques upstream and downstream of the construction area to determine whether changes in ambient turbidity levels exceed 20%, the threshold derived from the Sacramento and San Joaquin Rivers Basins Plan (Central Valley Regional Water Quality Control Board 2011). If it is determined that turbidity levels exceed the 20% threshold, then the project proponent and/or its contractors will adjust work to ensure that turbidity levels do not exceed the 20% threshold.

Measure 27: Implement Cofferdam Restrictions

The following restrictions will be implemented during installation of the cofferdams and cofferdam dewatering.

- The extent of cofferdam footprints will be limited to the minimum necessary to support construction activities.
- Sheet piles used for cofferdams will be installed and removed using a vibratory pile driver.
- Cofferdams will be installed and removed only during the proposed in-water work window (between May 1 and November 30).
- Cofferdams will not be left in place over winter where they could be overtopped by winter/spring flows and when juveniles of listed species are most likely to be present in the construction area.
- All pumps used during dewatering of cofferdams will be screened according to CDFW and NMFS guidelines for screens.
- Cofferdam dewatering and fish rescue/relocation from within cofferdams will commence immediately following cofferdam closure.

Measure 28: Prepare and Implement a Fish Rescue and Relocation Plan

The project proponent and/or its construction contractor will develop and implement a fish rescue and relocation plan to recover any fish trapped in cofferdams. The fish rescue

and relocation plan will be submitted to the resource agencies (CDFW, NMFS, and USFWS) for approval at least 60 days before initiating activities to install cofferdams. At a minimum, the plan will include the following.

- A requirement that fish rescue and relocation activities will commence immediately after cofferdam closure and that dewatering has sufficiently lowered water levels inside cofferdams to make it feasible to rescue fish.
- A description of the methods and equipment proposed to collect, transfer, and release all fish trapped within cofferdams. Capture methods may include seining, dip netting, and/or electrofishing as approved by CDFW, NMFS, and USFWS. The precise methods and equipment to be used will be developed cooperatively by CDFW, NMFS, USFWS, and the project proponent and/or contractor.
- A requirement that only CDFW-, NMFS-, and USFWS-approved fish biologists will conduct the fish rescue and relocation.
- A requirement that fish biologists will contact CDFW, NMFS, and USFWS immediately if any listed species are found dead or injured.
- A requirement that a fish rescue and relocation report be prepared and submitted to CDFW, NMFS, and USFWS within 5 business days following completion of the fish relocation. Data will be provided in tabular form and at a minimum will include the species and number rescued and relocated, approximate size of each fish (or alternatively, approximate size range if large number of individuals are encountered), date and time of their capture, and general condition of all live fish (e.g., good–active with no injuries; fair–reduced activity with some superficial injuries; poor–difficulty swimming/orienting with major injuries). For dead fish, additional data will include fork length and description of injuries and/or possible cause of mortality if it can be determined.

Measure 29: Prevent the Spread or Introduction of Aquatic Invasive Species

The project proponent or its contractors will implement the following actions to prevent the potential spread or introduction of AIS associated with the operation of barges and other in-water construction activities. Species of concern related to the operation of barges and other equipment in the lower Sacramento River include invasive mussels (e.g., quagga mussels [*Dreissena bugensis*] and zebra mussels [*Dreissena polymorpha*]) and aquatic plants (e.g., Brazilian waterweed [*Egeria densa*] and hydrilla [*Hydrilla verticillata*]) (California Department of Fish and Game 2008).

- The project proponent or its contractors will coordinate with the CDFW's Invasive Species Program to ensure that the appropriate BMPs are implemented to prevent the spread or introduction of AIS.
- Educate construction supervisors and managers about the importance of controlling and preventing the spread of AIS.
- Train vessel and equipment operators and maintenance personnel in the recognition and proper prevention, treatment, and disposal of AIS.

- If feasible, prior to departure of vessels from their place of origin and before in-water construction equipment is allowed to operate within the waters of the Sacramento River, thoroughly inspect and remove and dispose of all dirt, mud, plant matter, and animals from all surfaces that are submerged or may become submerged, or places where water can be held and transferred to the surrounding water.

Measure 30: Minimize or Avoid Temporary Construction Lighting and Permanent Bridge Lighting from Directly Radiating on Water Surfaces of the Sacramento River

The project proponent will minimize or avoid the effects of nighttime lighting on special-status fish species by implementing the following actions.

Temporary Construction Lighting

- Avoiding construction activities at night, to the maximum extent practicable.
- Using the minimal amount of lighting necessary to safely and effectively illuminate the work areas.
- Shielding and focusing lights on work areas and away from the water surface of the Sacramento River, to the maximum extent practicable.

Permanent Bridge Lighting

- Minimizing nighttime lighting of the bridge structure for aesthetic purposes.
- Using the minimal amount of lighting necessary to safely and effectively illuminate vehicular, bicycle, and pedestrian areas on the bridge.
- Shielding and focusing lights on vehicular, bicycle, and pedestrian areas and away from the water surface of the Sacramento River, to the maximum extent practicable.

4.4.1.7 Compensatory Mitigation

Implementation of the Measures 31 and 32 would compensate for permanent impacts on critical habitat and loss of riparian vegetation and SRA cover.

Measure 31: Purchase Channel Enhancement Credits for Impacts on Critical Habitat

Permanent impacts on critical habitat (bank and substrate below the OHWM and water column habitat), totaling 3.11 acres (up to 80,449 square feet [1.85 acre] from the new bridge piers and RSP and up to 55,000 square feet [1.26 acre] from bridge shading of aquatic habitat) will be mitigated at a 3:1 ratio. The project proponent proposes to mitigate the permanent loss of critical habitat through purchase of 9.33 acres of mitigation credits at a NMFS-approved anadromous fish conservation bank.

4.4.1.8 Cumulative Impacts

Current, future, and reasonably foreseeable actions in the project region that could also affect special-status fish species, SRA cover habitat, and critical habitat potentially affected by the proposed project include the following.

- Flood management projects affecting the Sacramento River.
- Restoration and other water-related projects in and near the Sacramento River that could affect fish or vegetation on the waterside of levees.
- Development in the West Sacramento area that could result in effects similar to those of the proposed project.

Without compensation, construction of the proposed project would contribute a small amount to the cumulative loss of suitable aquatic habitat (substrate, water column) for winter-run Chinook salmon in the project region. However, with implementation of the proposed avoidance and minimization efforts and compensatory mitigation, construction of the proposed project would not add to the cumulative effects on Sacramento River winter-run Chinook salmon.

Under the ESA, cumulative effects are "those effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area of the federal action subject to consultation" (50 CFR 402.2). Future federal actions that are unrelated to the proposed action are not considered in this assessment because they require separate consultation pursuant to Section 7 of the ESA.

Caltrans is not aware of any future state or private activities that are reasonably certain to affect winter-run Chinook salmon or designated critical habitat within the area potentially affected by the proposed project.

4.4.2 Central Valley Spring-Run Chinook Salmon

4.4.2.1 Status and Distribution

The NMFS listed the Central Valley ESU of spring-run Chinook salmon as threatened on September 16, 1999 and reaffirmed this listing on June 28, 2005. The ESU includes naturally spawned populations in the Sacramento River and its tributaries, including the Feather River, and the artificial propagation program at Feather River Fish Hatchery (FRFH). NMFS proposed critical habitat for Central Valley spring-run Chinook salmon on December 10, 2004, and published a final rule designating critical habitat for this ESU on September 2, 2005. The Central Valley spring-run Chinook salmon ESU was listed as threatened under CESA in February 1999.

Spring-run Chinook salmon may have once been the most abundant of Central Valley Chinook salmon (Mills and Fisher 1994), historically occupying the upstream reaches of all major river systems in the Central Valley where there were no natural barriers. The San Joaquin populations

were essentially extirpated by the 1940s; and populations in the upper Sacramento, Feather, and Yuba Rivers were eliminated with the construction of major dams during the mid-1900s (Yoshiyama et al. 1998). Naturally spawning populations of spring-run Chinook salmon currently are restricted to accessible reaches of the upper Sacramento River, Antelope Creek, Battle Creek, Beegum Creek, Big Chico Creek, Butte Creek, Clear Creek, Deer Creek, Mill Creek, Feather River, and Yuba River (California Department of Fish and Game 1998).

The abundance of Central Valley spring-run Chinook salmon, as measured by the number of adults returning to spawn, has averaged 7,800 natural spawning adults and 3,900 adults returning to hatcheries from 1993 to 2010 (CalFish 2011). Temporal and spatial overlap between spawning spring-run Chinook salmon and fall-run Chinook salmon in the Sacramento and Feather Rivers brings into question their genetic integrity. Genetically uncontaminated populations may exist in Deer Creek, Mill Creek, Butte Creek, and other eastside tributaries of the Sacramento River, including a growing population in Battle Creek.

The FRFH was constructed by DWR in the mid-1960s to mitigate for the loss of Chinook salmon and steelhead spawning habitat above Oroville Dam. The FRFH is the only hatchery in the Central Valley producing spring-run Chinook salmon. The current annual production target for spring-run Chinook salmon at the FRFH is 2 million smolts. From 2000 to 2009, annual releases of spring-run smolts ranged from approximately 0.75 to 1.3 million smolts (Cavallo et al. 2009).

4.4.2.2 Life History

Adult spring-run Chinook salmon enter the mainstem Sacramento River from February through September, with the peak upstream migration occurring from May through June (Yoshiyama et al. 1998). Adults generally enter tributaries from the Sacramento River between mid-April and mid-June (National Marine Fisheries Service 2006a). Spring-run Chinook salmon are sexually immature during upstream migration, and adults hold in deep, cold pools near spawning habitat until spawning commences in late summer and fall. Spring-run Chinook salmon spawn in the upper reaches of the mainstem Sacramento River and tributary streams (U.S. Fish and Wildlife Service 1995), with the largest tributary runs occurring in Butte, Deer, and Mill Creeks (Yoshiyama et al. 1998). Spawning typically begins in late August and may continue through October. Juveniles emerge in November and December in most locations but may emerge later when water temperature is cooler. Newly emerged fry remain in shallow, low-velocity edgewater (California Department of Fish and Game 1998).

Juvenile spring-run Chinook salmon typically spend up to 1 year rearing in fresh water before migrating to sea as yearlings, but some may migrate downstream as young-of-year juveniles. Rearing takes place in their natal streams, the mainstem of the Sacramento River, inundated floodplains (including the Sutter and Yolo Bypasses), and the Delta. Based on observations in

Butte Creek and the Sacramento River, young-of-year juveniles typically migrate from November through May. Yearling spring-run Chinook salmon migrate from October to March, with peak migration in November (Cramer and Demko 1997; Hill and Webber 1999). Downstream migration of yearlings typically coincides with the onset of the winter storm season, and migration may continue through March (California Department of Fish and Game 1998).

4.4.2.3 Factors Affecting Abundance

Reasons for the decline and current status of Central Valley spring-run Chinook salmon fall into three general categories: (1) loss of historical spawning habitat; (2) degradation of remaining habitat; and (3) threats to the genetic integrity of the wild spawning populations. The construction of debris, hydropower, flood control, and water supply dams eliminated virtually all historical spawning habitat of spring-run Chinook salmon. Current spawning is restricted to limited areas in mainstem reaches below the lowermost impassable dams and in a few tributaries where the habitat has been degraded by a number of historical and ongoing activities. Major factors that contributed to declines—and that currently limit salmon and steelhead populations—include altered flows and water temperatures from dam operations and water diversions; losses of suitable spawning substrate; channel alterations (e.g., channelization, levees) associated with navigation and flood risk reduction; and associated losses of riparian, floodplain, and wetland habitat.

Land use activities such as agricultural conversion and industrial and urban development have resulted in substantial losses and degradation of salmonid habitat. For example, historical and ongoing land uses in the Feather River downstream of Oroville Dam, including hydraulic mining, gravel mining, levee construction, agricultural encroachment, and urbanization, have resulted in severe constriction and fragmentation of the active floodplain and associated riparian, floodplain, and wetland habitats that once bordered the river (California Department of Water Resources 2004). In addition, levee construction and bank protection have adversely affected salmonid habitat by disrupting the natural erosional processes that create and maintain riparian habitat, SRA cover, and floodplain connectivity. Bank stabilization (e.g., rock revetment) has further simplified the structural and hydraulic characteristics of natural shorelines, eliminating the shallow, low-velocity river margins used by juvenile fish to escape from fast currents, deep water, and predators (U.S. Fish and Wildlife Service 2004).

Habitat blockage by dams poses an additional threat to spring-run Chinook salmon by preventing the spatial and temporal separation between spring-run and fall-run spawners that minimized competition for spawning habitat and maintained the genetic integrity of these runs prior to dams and intensive hatchery programs. For example, overlap in spawning between spring-run and fall-run Chinook salmon in the low-flow channel below Oroville Dam limits spawning success and

has likely resulted in significant hybridization of spring-run and fall-run in the Feather River. The continued practice of releasing large numbers of hatchery fall-run and spring-run Chinook salmon in San Pablo Bay results in substantial straying, further contributing the risk of genetic introgression of hatchery and wild stocks of spring-run and fall-run Chinook salmon (National Marine Fisheries Service 2009a).

4.4.2.4 Survey Results

Focused surveys for Central Valley spring-run Chinook salmon were not conducted. However, it is well documented that spring-run Chinook salmon use the BSA as a migration corridor during upstream (adult) and downstream (juvenile) migration. In addition, juvenile spring-run Chinook salmon use the lower reaches of the Sacramento River for rearing while emigrating to the ocean. Spawning and egg incubation do not occur in the BSA (Moyle 2002).

The temporal occurrence and relative abundance of juvenile spring-run Chinook salmon in the BSA can be inferred based on the weekly trawl surveys of the Sacramento River at Sherwood Harbor (RM 55) as part of the DJFMP (U.S. Fish and Wildlife Service 2015b). From January 2005 through March 2015, spring-run size juvenile Chinook salmon were detected in the trawls from December through May (Table 4-11).

Table 4-11. Number of Spring-Run Size Juvenile Chinook Salmon Captured by Trawl at Sherwood Harbor (RM 55) by Month (January 2005 through March 2015)

Month/ Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Monthly Total[a]
Jan	4	64		9			10	1	1		2	89
Feb	27	74	23	11	2	3	20	1		102	9	263
Mar	67	98	7	2	2	13	9	142		157	1	497
Apr	412	186	123	37	179	148	272	110	390	487		2344
May	21	110	15	8	41	5	5	4	5	6		220
Jun												0
Jul												0
Aug												0
Sep												0
Oct												0
Nov												0
Dec	27					34		11		21		93
Annual Total	**558**	**532**	**168**	**67**	**224**	**203**	**316**	**269**	**396**	**773**	**NA**	**3,506**

[a] 2015 data excluded from totals.
NA = Not applicable

4.4.2.5 Project Impacts

Project impacts on Central Valley spring-run Chinook salmon would be similar to those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

The proposed project is *likely to adversely* affect Central Valley spring-run Chinook salmon from exposure to underwater noise during pile driving activities and based on temporary effects to water quality (increased turbidity and suspended sediment), rearing and movement habitat (noise and shade), and channel substrates (cofferdams and temporary trestles); temporary and permanent effects on riparian and SRA cover habitat (vegetation removal, bridge and bike path construction); and permanent effects on aquatic habitat (construction of bridge piers, shade, and placement of RSP) in the Sacramento River.

Impacts on Central Valley Spring-Run Chinook Salmon Critical Habitat

The Sacramento River within the BSA is included in the designated critical habitat for Central Valley spring-run Chinook salmon (70 FR 52488, September 2, 2005). The primary constituent elements of critical habitat in the BSA include freshwater rearing habitat with water quantity and quality, natural cover, forage, and passage conditions supporting migration and rearing of spring-run Chinook salmon. Critical habitat for spring-run Chinook salmon in the BSA includes the river water column, river bottom, and adjacent riparian zone—up to the ordinary or mean high water elevation—which is used by adults for migration and juveniles for rearing.

The project is *likely to adversely affect* Central Valley spring-run Chinook salmon designated critical habitat. Impacts on winter-run Chinook salmon critical habitat include temporary effects to the water column (underwater noise and sound pressure, and water quality impacts) and channel substrate (cofferdams and trestles), and permanent loss of aquatic habitat (water column and substrate) and riparian and SRA cover habitat in the Sacramento River. These impacts would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.4.2.6 Avoidance and Minimization Efforts

Implementation of Measures 1–3, 5, and 23 through 30 would further avoid or minimize the potential for construction-related effects on adult and juvenile spring-run Chinook salmon and designated critical habitat in the BSA.

4.4.2.7 Compensatory Mitigation

Compensation for impacts on critical habitat for winter-run Chinook salmon (Measure 31) and loss of riparian and SRA cover habitat (Measure 4), as described above, also would benefit Central Valley spring-run Chinook salmon. No further compensatory mitigation would be required.

4.4.2.8 Cumulative Impacts

Cumulative impacts on Central Valley spring-run Chinook salmon would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.4.3 Central Valley Fall-Run and Late Fall–Run Chinook Salmon

4.4.3.1 Status and Distribution

The Central Valley fall-run and late fall–run Chinook salmon ESU includes all naturally spawning populations of fall-run and late fall–run Chinook salmon in the Sacramento and San Joaquin River basins and their tributaries east of the Carquinez Strait in California (64 FR 50394). On September 16, 1999, after reviewing the best available scientific and commercial information, NMFS determined that listing Central Valley fall- and late fall–run Chinook salmon was not warranted. On April 15, 2004, the Central Valley fall- and late fall–run Chinook salmon ESU was identified by NMFS as a species of concern (69 FR 19975).

The Central Valley fall- and late fall–run Chinook salmon ESU is not listed under CESA. However, Central Valley late fall–run Chinook salmon was classified as a Class 2 species of special concern by CDFG (now CDFW) in 1995 (Moyle et al. 1995). Class 2 species of special concern are species with low, scattered, or highly localized populations and require active management to prevent them from becoming Class 1 Species (i.e., species that conform to the state definitions of threatened or endangered species) (Moyle et al. 1995.)

Central Valley fall-run Chinook salmon historically spawned in all major tributaries, as well as the mainstems of the Sacramento and San Joaquin Rivers. The historical distribution of Central Valley late fall–run Chinook salmon is not well understood but is thought to be less extensive than that of fall-run. Late fall–run adults most likely spawned in the upper Sacramento and McCloud Rivers in reaches now blocked by Shasta Dam, as well as in major tributaries with adequate cold water in summer. There is also some evidence that they once spawned in the San Joaquin River in the Friant region and in other large San Joaquin tributaries (Yoshiyama et al. 1998).

The abundance of Central Valley fall- and late fall–run Chinook salmon escapement before 1952 is poorly documented. Reynolds et al. (1993) estimated that production of fall- and late fall–run Chinook salmon on the San Joaquin River historically approached 300,000 adults and probably averaged approximately 150,000 adults. Calkins et al. (1940) estimated fall- and late fall–run Chinook salmon abundance at 55,595 adults in the Sacramento River basin from 1931 to 1939. In the early 1960s, adult fall- and late fall–run Chinook salmon escapement was estimated to be 327,000 in the Sacramento River basin (California Department of Fish and Game 1965). In the mid-1960s, fall- and late fall–run Chinook salmon escapement to the San Joaquin River basin was estimated to be about 2,400 fish (Reynolds et al. 1993).

Long-term trends in adult fall-run Chinook salmon escapement since 1953 indicate that abundance in the Sacramento River has been consistently higher than abundance in the San

Joaquin River. Annual escapement on the Sacramento River has been characterized by relatively high variability, ranging from approximately 100,000 to over 800,000 fish. Sacramento River escapement showed a marked increase in abundance between 1990 and 2003, followed by a decline in abundance from 2004 to the present. In 2009, adult fall-run Chinook salmon returns to Central Valley rivers showed a substantial decline in both the Sacramento and San Joaquin River systems (CalFish 2010). Similar declines in adult escapement also were observed for coho salmon and Chinook salmon returning to other river systems in California (MacFarlane et al. 2008). Trends in adult fall-run Chinook salmon escapement in the San Joaquin River tributaries have been relatively low since the 1950s, ranging from several hundred adults to approximately 100,000 adults (Reynolds et al. 1993).

Adult escapement estimates for late fall–run Chinook salmon returning to the Sacramento River from 1971 through 2009 have ranged from several hundred adults to over 40,000 adults. Adult escapement showed a general trend of declining abundance between 1971 and 1997. During the late 1990s and continuing through 2006, escapement increased substantially but was characterized by high interannual variability. The 2008 and 2009 escapement estimates were lower than the previous 4 years but were not characterized by the severe decline observed for fall-run Chinook salmon (CalFish 2010).

4.4.3.2 Life History

Adult fall-run Chinook salmon migrate through the Delta and into Central Valley rivers from June through December and spawn from September through December. Peak spawning activity usually occurs in October and November. The life history characteristics of late fall–run Chinook salmon are not well understood. Adult late fall–run Chinook salmon migrate through the Delta and into the Sacramento River from October through April and may wait for 1 to 3 months before spawning from December through April. Peak spawning activity occurs in February and March. Chinook salmon typically mature between 2 and 6 years of age (Myers et al. 1998). The majority of Central Valley fall-run Chinook salmon spawn at age 3 (Moyle 2002).

Chinook salmon spawn in clean, loose gravel in swift, relatively shallow riffles, or along the margins of deeper river reaches where water temperatures, depths, and velocities are suitable for redd construction and egg incubation. Egg incubation for Central Valley fall-run Chinook salmon begins with spawning in September and can extend into March (Vogel and Marine 1991). Egg incubation for late fall–run Chinook salmon occurs from December through June (Vogel and Marine 1991; Earley et al. 2010).

Central Valley fall-run Chinook salmon fry (i.e., juveniles shorter than 2 inches long) generally emerge from December through March, with peak emergence occurring by the end of January. In general, fall-run Chinook salmon fry abundance in the Delta increases following high winter

flows. Most fall-run Chinook salmon fry rear in fresh water from December through June, with smolt emigration occurring primarily from April through June. Smolts that arrive in the estuary after rearing upstream migrate quickly through the Delta and Suisun and San Pablo Bays. A very small number (generally less than 5%) of fall-run juveniles spend over a year in fresh water and emigrate as yearling smolts the following November through April. Central Valley late fall–run Chinook salmon fry generally emerge from April through June. Late fall fry rear in fresh water from April through the following April and emigrate as smolts from October through February (Snider and Titus 2000).

Upon emergence from the gravel, fry swim or are displaced downstream (Healey 1991). Fry seek nearshore habitats providing shallow water; vegetation; and substrates that provide aquatic and terrestrial invertebrates, cover and shelter from predators, and slower water velocities for resting (National Marine Fisheries Service 1996). These shallow-water habitats are considered to be more productive rearing habitat than the deeper main river channels. Higher juvenile salmon growth rates associated with greater prey consumption rates and favorable water temperatures have been observed on floodplains with extensive shallow-water habitats (Sommer et al. 2001).

4.4.3.3 Factors Affecting Abundance

Factors that contributed to the decline of Central Valley fall-/late fall–run Chinook salmon are similar to those described earlier for Sacramento River winter-run Chinook salmon and Central Valley spring-run Chinook salmon. Access to much or all of their historical spawning habitat was eliminated by dams, although fall-run Chinook salmon were less affected by these barriers because much of their historical spawning habitat included the lower gradient reaches downstream of these dams (Reynolds et al. 1993; McEwan 2001). However, changes in the seasonal hydrologic patterns resulting from water diversions and operation of upstream reservoirs for water supply, flood control, and hydroelectric power generation have altered flows, water temperatures, and other habitat conditions for fall-run Chinook salmon and other species in these reaches (Williams 2006).

Properly functioning migration corridors for juvenile Central Valley fall- and late fall–run Chinook salmon consist of a wide range of habitat types, including primary and secondary channels, streambanks, floodplains, and marshes. Much of the Sacramento and San Joaquin River corridor and Delta have been leveed, channelized, and modified with rip-rap for flood risk reduction, thereby reducing and degrading the value and availability of natural habitat for rearing and emigrating juvenile Chinook salmon (Brandes and McLain 2001). Modification of natural flow regimes from upstream reservoir operations has resulted in dampening of the hydrograph, reducing the extent and duration of seasonal floodplain inundation and other flow-dependent habitat used by migrating juvenile Chinook salmon (70 FR 52488; Sommer et al. 2001;

California Department of Water Resources 2005). Tidal and floodplain habitat areas provide important rearing habitat for foraging juvenile salmonids, including Central Valley fall-run Chinook salmon. Studies have shown that these salmonids may spend from 2 to 3 months rearing in these habitat areas, and losses resulting from land reclamation and levee construction are considered to be major stressors on juvenile salmonids (Williams 2009). Similarly, channel margins provide valuable rearing and connectivity habitat along migration corridors, particularly for smaller juvenile fry, such as fall-run Chinook salmon.

Predation on juvenile salmon by non-native fish has been identified as an important threat to fall- and late fall–run Chinook salmon in areas with high densities of non-native fish that prey on out-migrating juvenile salmon (e.g., smallmouth and largemouth bass, striped bass, and catfish) (Lindley and Mohr 2003). The low spatial complexity and reduced habitat diversity (e.g., lack of cover) of channelized waterways in the rivers and Delta reduce refuge space for salmon from predators (Raleigh et al. 1984; Missildine et al. 2001; 70 FR 52488).

Other factors that have contributed to the current status of Central Valley fall-run and late fall–run Chinook salmon and currently affect their abundance include harvest, artificial propagation programs (ecological and genetic effects), entrainment, and contaminants (Moyle 2002).

4.4.3.4 Survey Results

Focused surveys for Central Valley fall and late fall–run Chinook salmon were not conducted. However, it is well documented that fall and late fall–run Chinook salmon use the BSA as a migration corridor during upstream (adult) and downstream (juvenile) migration. In addition, Central Valley fall and late fall–run Chinook salmon seasonally use the lower reaches of the Sacramento River for rearing while emigrating to the ocean. Spawning and egg incubation do not occur in the BSA (Moyle 2002).

The temporal occurrence and relative abundance of juvenile fall and late fall–run Chinook salmon in the BSA can be inferred based on the weekly trawl surveys of the Sacramento River at Sherwood Harbor (RM 55) as part of the DJFMP (U.S. Fish and Wildlife Service 2015b). From January 2005 through March 2015, fall-run size juvenile Chinook salmon were detected in the trawls from December through August, although most were detected in the trawls from January through May (Table 4-12).

Table 4-12. Number of Fall-Run Size Juvenile Chinook Salmon Captured by Trawl at Sherwood Harbor (RM 55) by Month (January 2005 through March 2015)

Month/ Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Monthly Total[a]
Jan	220	218	4	493	1	80	64	558	435		1	2,073
Feb	498	328	2,021	688	414	139	84	156	78	15,471	196	19,877
Mar	789	473	143	5	82	39	88	370	5	6,543	1	8,537
Apr	1,409	278	1,038	62	274	399	746	624	826	969		6,625
May	2,388	2,598	950	409	981	47	407	358	548	92		8,778
Jun	48	110	17	12	25	6	117	13	16	1		365
Jul	8	33	54	1	6	4	3	2	1			112
Aug	1	4	3	1	1			3	1			14
Sep												0
Oct												0
Nov												0
Dec	67	1				225		67		103		463
Annual Total	**5,428**	**4,043**	**4,230**	**1,671**	**1,784**	**939**	**1,509**	**2,151**	**1,910**	**23,179**	**NA**	**46,844**

[a] 2015 data excluded from totals.
NA = Not applicable

By contrast, late fall–run size juvenile Chinook salmon were detected in the trawls in every season; they were not detected in the trawls in February, March, and June during this period (Table 4-13).

Table 4-13. Number of Late Fall–Run Size Juvenile Chinook Salmon Captured by Trawl at Sherwood Harbor (RM 55) by Month (January 2005 through March 2015)

Month/ Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Monthly Total[a]
Jan	1		1	1								3
Feb												0
Mar												0
Apr		1	1					1				3
May	8											8
Jun												0
Jul		1	11									12
Aug	1	2			1			1				5
Sep		1				1						2
Oct						1						1
Nov				1	1			5				7
Dec	1	1		1	1			5		5		14
Annual Total	**11**	**6**	**13**	**3**	**3**	**2**	**0**	**12**	**0**	**5**	**NA**	**55**

[a] 2015 data excluded from totals.
NA = Not applicable

4.4.3.5 Project Impacts

Project impacts on Central Valley fall and late fall–run Chinook salmon would be similar to those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section. Because Central Valley fall and late fall–run Chinook salmon are not listed under ESA, no take would be associated with implementation of the project.

Impacts on Central Valley Fall-Run and Late Fall–Run Chinook Salmon Critical Habitat

Critical habitat has not been designated for the Central Valley fall-run and late fall-run Chinook salmon ESU because the ESU is not listed under ESA. Consequently, no impacts on Central Valley fall-run and late fall-run Chinook salmon critical habitat would result from implementation of the project. However, Central Valley fall- and late fall-run Chinook salmon habitats are protected under the MSA as EFH. Those waters and substrate that support Central Valley fall-run and late fall–run Chinook salmon growth to maturity are included as EFH. Effects on Pacific salmon EFH are described under "Essential Fish Habitat" later in this chapter.

4.4.3.6 Avoidance and Minimization Efforts

Implementation of Measures 1–3, 5, and 23 through 30 would avoid or minimize the potential for project-related effects on adult and juvenile fall and late fall–run Chinook salmon.

4.4.3.7 Compensatory Mitigation

Compensation for impacts on critical habitat for winter-run Chinook salmon (Measure 31) and riparian and SRA cover habitat losses (Measure 4), as described above, also would benefit Central Valley fall and late fall–run Chinook salmon. No further compensatory mitigation would be required.

4.4.3.8 Cumulative Impacts

Cumulative effects to Central Valley fall and late fall–run Chinook salmon would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.4.4 Central Valley Steelhead

4.4.4.1 Status and Distribution

The California Central Valley (CCV) steelhead (*Oncorhynchus mykiss*) DPS was federally listed as threatened on March 19, 1998 (National Marine Fisheries Service 1998) (63 FR 13347). The threatened status of CCV steelhead was reaffirmed in NMFS's final listing determination on January 5, 2006 (71 FR 834) (National Marine Fisheries Service 2006a); at the same time, NMFS adopted the term *DPS*, in place of *ESU*, to describe Central Valley steelhead and other population segments of this species. NMFS originally designated critical habitat for CCV steelhead on February 16, 2000 (National Marine Fisheries Service 2000). However, following a lawsuit (*National Association of Home Builders et al. v. Donald L. Evans, Secretary of*

Commerce, et al.), NMFS decided to rescind the listing and re-evaluate how to classify critical habitat for several ESUs (now DPSs) of steelhead. Critical habitat for CCV steelhead was redesignated by NMFS on September 2, 2005 (70 FR 52488) (National Marine Fisheries Service 2005b). The DPS includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries. Artificially propagated fish from Coleman National Fish Hatchery and FRFH are included in the DPS (National Marine Fisheries Service 2006a). CCV steelhead are not listed under CESA.

Steelhead ranged throughout the tributaries of the Sacramento and San Joaquin Rivers prior to dam construction, water development, and watershed perturbation dating from the 19th and 20th centuries. Wild stocks are now mostly confined to the upper Sacramento River downstream of Keswick Dam; upper Sacramento River tributaries such as Deer, Mill, and Antelope Creeks; and the Yuba River downstream of Englebright Dam. Populations may also exist in Big Chico and Butte Creeks, and a few wild steelhead are produced in the American and Feather Rivers (McEwan and Jackson 1996). The abundance of naturally reproducing CCV steelhead, as measured by the number of adults returning to spawn, is largely unknown. Natural escapement in 1995 was estimated to be about 1,000 adults each for Mill and Deer Creeks and the Yuba River (S. P. Cramer and Associates 1995). Hatchery returns have averaged around 10,000 adults (Mills and Fisher 1994). The most recent annual estimate of adults spawning upstream of RBDD is less than 2,000 fish (National Marine Fisheries Service 2006a).

4.4.4.2 Life History

Oncorhynchus mykiss have one of the most complex life histories of any salmonid species, exhibiting both anadromous and freshwater resident life histories. Freshwater residents typically are referred to as rainbow trout, and those exhibiting an anadromous life history are called steelhead (National Marine Fisheries Service 1999). Steelhead exhibit highly variable life history patterns throughout their range but are broadly categorized into winter and summer reproductive ecotypes. Winter steelhead, the most widespread reproductive ecotype and the only type currently present in Central Valley streams (McEwan and Jackson 1996), become sexually mature in the ocean; enter spawning streams in summer, fall, or winter; and spawn a few months later in winter or late spring (Meehan and Bjornn 1991; Behnke 1992).

In the Sacramento River, adult winter steelhead migrate upstream during most months of the year, beginning in July, peaking in September, and continuing through February or March (Hallock 1987). Spawning occurs primarily from January through March but may begin as early as late December and may extend through April (Hallock 1987). Individual steelhead may spawn more than once, returning to the ocean between each spawning migration.

Juvenile steelhead rear a minimum of 1 year, and typically 2 or more years, in fresh water before migrating to the ocean as smolts. Juvenile migration to the ocean generally occurs from December through August. The peak months of juvenile migration are January to May (McEwan 2001). The importance of main channel and floodplain habitats to steelhead in the lower Sacramento River and upper Delta is not well understood. Steelhead smolts have been found in the Yolo Bypass during winter and spring inundation (Sommer pers. comm.), but the importance of this and other floodplain areas in the lower Sacramento River and upper Delta is not yet clear.

4.4.4.3 Factors Affecting Abundance

The decline in steelhead populations is attributable to changes in habitat quality and quantity. The availability of steelhead habitat in the Central Valley has been reduced by as much as 95% or more due to barriers created by dams (National Marine Fisheries Service 1996). Populations have been most severely affected by dams blocking access to the headwaters of all major tributaries; consequently, most runs are maintained through artificial production. The decline of naturally produced Central Valley steelhead has been more precipitous than that of hatchery stocks. Populations in the range's southern portion have experienced the most severe declines. Other factors contributing to the decline of steelhead in the Central Valley are mining, agriculture, urbanization, logging, harvest, hatchery influences, flow management (including reservoir operations), hydropower generation, and water diversion and extraction (National Marine Fisheries Service 1996).

Factors such as levee construction and bank armoring have altered the critical habitat of steelhead. These factors reduce floodplain habitat, change river bank substrate size, and decrease the amount of riparian and SRA habitat, which in turn, reduce habitat availability and quality (National Marine Fisheries Service 2006a).

4.4.4.4 Survey Results

Focused surveys for Central Valley steelhead were not conducted. However, it is well documented that steelhead use the BSA as a migration corridor during upstream (adult) and downstream (juvenile) migration. In addition, juvenile steelhead seasonally use the lower reaches of the Sacramento River for rearing while emigrating to the ocean. Spawning and egg incubation do not occur in the BSA (Moyle 2002).

The temporal occurrence and relative abundance of juvenile steelhead in the BSA can be inferred based on the weekly trawl surveys of the Sacramento River at Sherwood Harbor (RM 55) as part of the DJFMP (U.S. Fish and Wildlife Service 2015b). From January 2005 through March 2015, adipose fin-clipped juvenile steelhead (indicating hatchery origin) and unclipped (wild) steelhead were detected in the trawls from January through June (Table 4-14).

Table 4-14. Total Number of Wild (Unclipped) and Hatchery (Adipose Fin-Clipped) Juvenile Steelhead Captured by Trawl at Sherwood Harbor (Rivermile 55) by Month (January 2005 through March 2015)[a]

Month/ Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Monthly Total[b]
Jan	23(1)	4	1	13(1)	11	1	3	34(1)	3	1	1	94(3)
Feb	44	36(2)	33(1)	42	45	31(4)	23	81(5)	3	256(5)	8	594(17)
Mar	19	12	1	1	3	1	11	13	1	12(3)		74(3)
Apr	6(1)		3(1)		1	6(2)	1	4(1)	3(2)	4(1)		28(8)
May	5(2)	1	3		2(2)	1(1)	1(1)	2(1)	1(1)			16(8)
Jun		1(1)	1(1)				1(1)					3(3)
Jul												
Aug												
Sep												
Oct												
Nov												
Dec												
Annual Total	**97(4)**	**54(3)**	**42(3)**	**56(1)**	**62(2)**	**40(7)**	**40(2)**	**134(8)**	**11(3)**	**273(9)**	**NA**	**809(42)**

[a] Number of unclipped (wild) steelhead in parentheses.
[b] 2015 data excluded from totals.
NA = Not applicable

4.4.4.5 Project Impacts

Project impacts on Central Valley steelhead would be similar to those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

The proposed project is *likely to adversely affect* Central Valley steelhead based on the potential for exposure to underwater noise during pile driving activities and temporary effects to water quality (increased turbidity and suspended sediment), rearing and movement habitat (noise and shade), and channel substrates (cofferdams and temporary trestles); temporary and permanent effects on riparian and SRA cover habitat (vegetation removal, bridge and bike path construction); and permanent effects on aquatic habitat (construction of bridge piers, shade, and placement of RSP) in the Sacramento River.

Impacts on Central Valley Steelhead Critical Habitat

The Sacramento River within the BSA is included in the designated critical habitat for Central Valley steelhead (70 FR 52488, September 2, 2005). The primary constituent elements of critical habitat in the BSA include freshwater rearing habitat with water quantity and quality, natural cover, forage, and passage conditions supporting migration and rearing of steelhead. Critical habitat for Central Valley steelhead in the BSA includes the river water column, river bottom, and adjacent riparian zone—up to the ordinary or mean high water elevation—which is used by adults for migration and juveniles for rearing.

The project is *likely to adversely affect* Central Valley steelhead designated critical habitat. Impacts on steelhead critical habitat include temporary effects to the water column (underwater noise and sound pressure, and water quality impacts) and channel substrate (cofferdams and trestles), and permanent loss of aquatic habitat (water column and substrate) and riparian and SRA cover habitat in the Sacramento River. These impacts would be the same as those discussed earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.4.4.6 Avoidance and Minimization Efforts

Implementation of Measures 1–3, 5, and 23 through 30 would further avoid or minimize the potential for construction-related effects on adult and juvenile Central Valley steelhead and designated critical habitat in the BSA.

4.4.4.7 Compensatory Mitigation

Compensation for impacts on critical habitat for winter-run Chinook salmon (Measure 31) and riparian and SRA cover habitat losses (Measure 4), as described above, also would benefit Central Valley steelhead. No further compensatory mitigation would be required.

4.4.4.8 Cumulative Impacts

Cumulative effects on Central Valley steelhead would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.4.5 Southern Distinct Population Segment of North American Green Sturgeon

4.4.5.1 Status and Distribution

NMFS listed the southern DPS of North American green sturgeon as threatened under ESA on April 7, 2006 (National Marine Fisheries Service 2006b). The southern DPS includes the spawning population in the Sacramento River and Feather River (Moyle 2002; Van Eenennaam 2005). Critical habitat was designated by NMFS on October 9, 2009 (74 FR 52300).

On January 23, 2003, NMFS determined that green sturgeon (*Acipenser medirostris*) are comprised of two populations, a northern and a southern DPS (National Marine Fisheries Service 2003). The northern DPS includes populations extending from the Eel River northward, and the southern DPS includes populations south of the Eel River to the Sacramento River. The Sacramento River supports the southernmost spawning population of green sturgeon (Moyle 2002). On April 6, 2005, NMFS determined that the northern DPS does not warrant listing under ESA, but it remains on the Species of Concern List (National Marine Fisheries Service 2005c). On April 7, 2006, NMFS determined that the southern DPS of green sturgeon was threatened under ESA (National Marine Fisheries Service 2006b). On October 9, 2009, NMFS (74 FR

52300) designated critical habitat for the green sturgeon southern DPS throughout most of its occupied range.

Green sturgeon were classified as a Class 1 species of special concern by CDFW in 1995 (Moyle et al. 1995). Class 1 species of special concern are those that conform to the State definitions of threatened or endangered and could qualify for addition to the official list. On March 20, 2006, emergency green sturgeon regulations were put into effect by CDFW, requiring a year-round zero bag limit of green sturgeon in all areas of the state (California Department of Fish and Game 2006).

4.4.5.2 Life History

The green sturgeon is anadromous, but it is the most marine-oriented of the sturgeon species and has been found in nearshore marine waters from Mexico to the Bering Sea (Colway and Stevenson 2007; Moyle 2002; National Marine Fisheries Service 2005c). The northern DPS has included spawning populations in the Rogue, Klamath, and Eel Rivers. The southern DPS has two spawning populations, in the Sacramento River and Feather River (Van Eenennaam 2005; National Marine Fisheries Service 2005d, 2010). Adults typically migrate upstream into rivers between late February and late July. Spawning occurs from March to July, with peak spawning from mid-April to mid-June. Green sturgeon are believed to spawn every 3–5 years, although recent evidence indicates that spawning may be as frequent as every 2 years (National Marine Fisheries Service 2005c, 2010).

Preferred spawning habitats are thought to contain large cobble in deep and cool pools with turbulent water (California Department of Fish and Game 2002; Moyle 2002; Adams et al. 2002). Little is known about the specific spawning habitat preferences of green sturgeon. Adult green sturgeon are believed to broadcast their eggs in deep, fast water over large cobble substrate, where the eggs settle into the interstitial spaces (Moyle 2002). Spawning is generally associated with water temperatures from 46 to 57 degrees Fahrenheit (°F). In the Central Valley, spawning occurs in the Sacramento River upstream of Hamilton City, perhaps as far upstream as Keswick Dam (Adams et al. 2002), and possibly in the lower Feather River (Van Eenennaam 2005; Moyle 2002). Water temperatures in spawning and egg incubation areas are critical; temperatures greater than 19 degrees Celsius (°C) (66.2°F) are lethal to green sturgeon embryos (Cech et al. 2000; Mayfield and Cech 2004; Van Eenennaam et al. 2005; Allen et al. 2006). Green sturgeon eggs hatch in approximately 8 days at 55°F (Moyle 2002). After 6 days, the larvae exhibit nocturnal swim-up activity (Deng et al. 2002). After about 10 days, they begin nocturnal downstream migrational movements (Kynard et al. 2005). Juvenile green sturgeon continue to exhibit nocturnal behavior beyond the metamorphosis from larval to juvenile stages. Larvae begin feeding 10 days after hatching. Young green sturgeon appear to rear for the first

1 to 2 months in the upper Sacramento River between Keswick Dam and Hamilton City (California Department of Fish and Game 2002). Metamorphosis to the juvenile stage is complete within 45 days of hatching. Juveniles spend 1 to 4 years in fresh and estuarine waters and migrate to salt water (Nakamoto et al. 1995) at lengths of 300–750 mm (National Marine Fisheries Service 2005c).

Little is known about movements, habitat use, and feeding habits of green sturgeon. Green sturgeon have been salvaged at the state and federal fish collection facilities in every month, indicating that they are present in the Delta year-round. Juveniles and adults are reported to feed on benthic invertebrates, including shrimp and amphipods, and small fish (National Marine Fisheries Service 2005c).

4.4.5.3 Factors Affecting Abundance

The historical decline of the southern DPS of green sturgeon has been largely attributed to the reduction of spawning habitat area. Keswick and Shasta Dams on the Sacramento River and Oroville Dam on the Feather River are impassable barriers that prevent green sturgeon from accessing what were likely historical spawning grounds upstream of these dams. Other potential migration barriers or impediments include RBDD, the Sacramento Deep Water Ship Channel locks, Fremont Weir, Sutter Bypass, the Delta Cross Channel in the Sacramento River, and Shanghai Bench and Sunset Pumps on the Feather River. Other factors that have been identified as potential threats to green sturgeon are reductions in freshwater outflow in the Delta during larval dispersal and rearing, high water temperatures during spawning and incubation, entrainment by water diversions, contaminants, predation and other impacts by introduced species, and poaching (National Marine Fisheries Service 2005c).

Channelization of the lower Sacramento River has resulted in the removal of riparian and IWM, which simplify ecosystem functions. Simplification results in reduced food input and pollutant and nutrient processing (Sweeney et al. 2004 as cited in National Marine Fisheries Service 2006a). These factors have degraded habitat quality for larvae and post-larvae and, to a lesser extent, rearing and migrating juvenile and/or adult green sturgeon (National Marine Fisheries Service 2006a).

4.4.5.4 Survey Results

Focused surveys for North American green sturgeon were not conducted. However, it is well documented that green sturgeon use the BSA as a migration corridor during upstream (adult) and downstream (juvenile) migration. In addition, juvenile green sturgeon use the lower reaches of the Sacramento River for seasonal rearing. Spawning and egg incubation do not occur in the BSA (Moyle 2002).

Green sturgeon, which are benthic-oriented, generally are not susceptible to the USFWS trawls that sample the water column; therefore, little is known about their seasonal use of habitats and relative abundance in the BSA. However, general information on their distribution and habitat use indicates that green sturgeon have the potential to occur in the BSA year-round.

4.4.5.5 Project Impacts

Project impacts on North American green sturgeon would be similar to those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

The proposed project is *likely to adversely affect* North American green sturgeon based on the potential for exposure to underwater noise during pile driving activities and temporary effects to water quality (increased turbidity and suspended sediment), rearing and movement habitat (noise and shade), and channel substrates (cofferdams and temporary trestles); temporary and permanent effects on riparian and SRA cover habitat (vegetation removal, bridge and bike path construction); and permanent effects on aquatic habitat (construction of bridge piers, shade, and placement of RSP) in the Sacramento River.

Impacts on North American Green Sturgeon Critical Habitat

The Sacramento River within the BSA is included in the designated critical habitat for the southern DPS of North American green sturgeon (74 FR 52300, October 9, 2009). The primary constituent elements of critical habitat in the BSA include freshwater areas with water flow, water quality, depth, forage, sediment quality, and passage conditions supporting migration and rearing of green sturgeon. Critical habitat for North American green sturgeon in the BSA includes the river water column, river bottom, and adjacent riparian zone—up to the ordinary or mean high water elevation—which is used by adults for migration and juveniles for rearing.

The project *is likely to adversely affect* North American green sturgeon designated critical habitat. Impacts on North American green sturgeon critical habitat include temporary effects on the water column (underwater noise and sound pressure, and water quality impacts) and channel substrate (cofferdams and trestles), and permanent loss of aquatic habitat (water column and substrate) and riparian and SRA cover habitat in the Sacramento River. These impacts would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.4.5.6 Avoidance and Minimization Efforts

Implementation of Measures 1–3, 5, and 23 through 30 would further avoid or minimize the potential for construction-related effects on adult and juvenile North American green sturgeon and designated critical habitat in the BSA.

4.4.5.7 Compensatory Mitigation

Compensation for impacts on critical habitat for winter-run Chinook salmon (Measure 31) and riparian and SRA cover habitat losses (Measure 4), as described above, would also benefit North American green sturgeon. No further compensatory mitigation would be required.

4.4.5.8 Cumulative Impacts

Cumulative effects on North American green sturgeon would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.4.6 Delta Smelt

4.4.6.1 Status and Distribution

Delta smelt was federally listed as threatened on March 5, 1993 (58 FR 12854–12863), and critical habitat was designated on December 19, 1994 (59 FR 65256–65278). In response to several lawsuits, USFWS conducted a 5-year status review for delta smelt. USFWS concluded on March 31, 2004, that delta smelt abundance remained relatively low compared to historical levels and that many of the threats to the species identified at the time of listing were still in existence, precluding de-listing of the species (U.S. Fish and Wildlife Service 2004). Subsequent indices of delta smelt abundance based on results of CDFW fishery sampling have shown that the abundance of delta smelt continued to decline to record low numbers.

In March 2006, several environmental groups filed an emergency petition with USFWS, requesting that the status of delta smelt be elevated from threatened to endangered under ESA (Center for Biological Diversity et al. 2006). The emergency petition was not approved by USFWS; however, on July 10, 2008, USFWS announced in a 90-day finding that consideration for reclassification of delta smelt was warranted and that a status review would be initiated (73 FR 39639). On April 7, 2010, USFWS ruled that the change in the status of delta smelt from threatened to endangered was warranted but was precluded by other higher priority listing actions (75 FR 17667).

Delta smelt was listed as a threatened species under CESA on December 9, 1993. In February 2007, an emergency petition was filed with the California Fish and Game Commission to elevate the status of delta smelt from threatened to endangered under CESA (The Bay Institute et al. 2007). On March 4, 2009, the California Fish and Game Commission elevated the status of delta smelt to endangered under CESA.

Historically, delta smelt populations have fluctuated greatly in response to their 1-year life cycle and ever-changing environmental conditions. In the last 30 years, delta smelt populations have shown a long-term decline in the upper estuary (the Delta and Suisun Bay), beginning with an

abrupt decline in 1982 (Kimmerer 2002) and extremely low abundance in recent years as part of the pelagic organism decline (POD) (Sommer et al. 2007; Baxter et al. 2010). The low abundance of delta smelt since the early 1980s is attributed to a number of interacting factors. The principal factors contributing to the decline in delta smelt abundance include reductions in outflows and entrainment losses to water diversions, especially by the SWP and CVP pumping facilities located in the south Delta; extremely high river outflows that flush delta smelt and zooplankton out of the system; changes in prey abundance and composition caused by introduced species; predation by non-native species; toxic substances, including agricultural pesticides, heavy metals, and other compounds; disease; and loss of genetic integrity through interbreeding with the introduced Wagasaki smelt (Moyle 2002; Bennett 2005).

The geographic distribution of delta smelt occurs primarily downstream of Isleton on the Sacramento River, in the Cache Slough subregion (Cache Slough–Liberty Island and the Deep Water Ship Channel [DWSC]), downstream of Mossdale on the San Joaquin River, and Suisun Bay and Suisun Marsh (Moyle 2002;). Delta smelt also have been collected in the Petaluma and Napa Rivers (Bennett 2005); the Sacramento River above Rio Vista; and Cache, Lindsey, Georgiana, Prospect, Beaver, Hog, Sycamore, and Barker Sloughs (U.S. Fish and Wildlife Service 1996). Delta smelt have been observed in the Sacramento River as far upstream as the mouth of the Feather River and in the DWSC as far upstream as West Sacramento (Merz et al. 2011). Over the last 2 decades, the center of adult delta smelt abundance in fall (September through December) has been the West Delta and Suisun Bay subregions (Sommer et al. 2011). There is evidence that a life-history contingent of delta smelt may remain in the Cache Slough subregion throughout their lives (Nobriga et al. 2008; Sommer et al. 2011).

4.4.6.2 Life History

Delta smelt are endemic to the Sacramento–San Joaquin estuary and are found seasonally in Suisun Bay and Suisun Marsh (Moyle 2002). They typically are found in shallow water (<10 feet) where salinity ranges from 2 to 7 parts per thousand (ppt), although they have been observed at salinities between 0 and 18.4 ppt (Moyle 2002). Delta smelt have relatively low fecundity and most live for 1 year (Moyle 2002). They feed on planktonic copepods, cladocerans, amphipods, and insect larva (Moyle 2002).

Delta smelt are semi-anadromous. During their spawning migration, adults move into the freshwater channels and sloughs of the Delta between December and January (Moyle 2002). Spawning occurs between January and July, with peak spawning from April through mid-May (Moyle 2002). Spawning locations in the Delta have not been identified and are inferred from larval catches (Bennett 2005). Larval fish have been observed in Montezuma Slough (Wang 1986); Suisun Slough in Suisun Marsh (Moyle 2002); the Napa River estuary (Stillwater

Sciences 2006); the Sacramento River above Rio Vista; and Cache, Lindsey, Georgiana, Prospect, Beaver, Hog, Sycamore, and Barker Sloughs (U.S. Fish and Wildlife Service 1996). Spawning also was detected in the Sacramento River up to Garcia Bend (RM 51) during drought conditions as a result of increased saltwater intrusion that moved delta smelt spawning and rearing farther inland (Wang and Brown 1993). Laboratory experiments have found eggs to be adhesive, demersal, and usually attached to substrate composed of gravel, sand, or other submerged material (Moyle 2002; Wang 1991). Hatching takes approximately 9 to 13 days, and larvae begin feeding 4 to 5 days later (Moyle 2002). Newly hatched larvae contain a large oil globule that makes them semi-buoyant and allows them to stay near the bottom (Moyle 2002). As their fins and swim bladder develop, they move higher into the water column and are transported downstream to the open waters of the estuary (Moyle 2002).

4.4.6.3 Factors Affecting Abundance

Diversions and Delta inflow and outflow may affect survival of delta smelt. Estimates of delta smelt entrainment at the CVP and SWP South Delta export facilities suggest a population decline in the early 1980s, mirroring the decline indicated by mid-water trawl, summer tow-net, Kodiak trawl, and beach seine data (Bennett 2005). Diversions and upstream storage, including operation of the CVP and SWP, control Delta inflow and outflow during most months. Reduced Delta flow may inhibit or slow movement of larvae and juveniles to estuarine rearing habitat, increasing their residence in the deeper and narrower channels of the Delta and exposure to lower prey availability and increased predation (Moyle 2002). Reduced Delta flow also may increase entrainment in diversions, including entrainment at the CVP and SWP export pumps (Moyle 2002). Additional factors affecting delta smelt abundance include extremely high river outflow that increases entrainment at export facilities, changes in prey abundance and composition, predation by non-native species, toxic substances, disease, and loss of genetic integrity through interbreeding with the introduced Wagasaki smelt (Moyle 2002; Bennett 2005).

4.4.6.4 Survey Results

Focused surveys for delta smelt were not conducted. However, it is well documented that delta smelt occur in the Sacramento River in the vicinity of the BSA. Spawning locations in the Delta have not been identified and are inferred from the location of gravid females and larval catches (Bennett 2005).

The temporal occurrence and relative abundance of adult delta smelt in the vicinity of the BSA can be inferred based on the weekly trawl surveys of the Sacramento River at Sherwood Harbor (RM 55) as part of the DJFMP (U.S. Fish and Wildlife Service 2015b). In addition to collecting data on the relative number and timing of occurrence of delta smelt, USFWS collects information on the maturation status of adult smelt (i.e., individuals are physically examined at

the time of capture to determine their readiness to spawn based on whether eggs or milt can be manually expressed from the individual). Maturation status provides information on the potential timing of spawning and, therefore, the potential occurrence of the species' eggs and larvae in the river. The occurrence of mature adults in the trawl samples suggests that delta smelt may spawn in this part of the Sacramento River, including the BSA.

From January 2005 through March 2015, adult delta smelt (some in spawning condition) were detected in the trawls from February through May, although most were detected in the trawls in March (Table 4-15). Because of the proximity of the BSA to Sherwood Harbor, it was assumed that the occurrence of delta smelt in the BSA is similar to that observed at Sherwood Harbor.

Table 4-15. Number of Delta Smelt Captured by Trawl at Sherwood Harbor (RM 55) by Month (January 2005 through March 2015)

Month/ Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Monthly Total[a]
Jan												0
Feb	1											1
Mar	3			1		1		28		18		51
Apr	2			1				1	1	3		8
May		1										1
Jun												0
Jul												0
Aug												0
Sep												0
Oct												0
Nov												0
Dec												0
Annual Total	**6**	**1**	**0**	**2**	**0**	**1**	**0**	**29**	**1**	**21**	**NA**	**61**

[a] 2015 data excluded from totals.
NA = Not applicable

4.4.6.5 Project Impacts

Project impacts on delta smelt would be similar to those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section. However, because delta smelt spawn in the Delta and lower Sacramento River, the proposed project also has the potential to affect spawning habitat.

The proposed project is *likely to adversely affect* delta smelt based on the potential for exposure to underwater noise during pile driving activities and temporary effects on water quality (increased turbidity and suspended sediment), rearing and movement habitat (noise and shade), and channel substrates (cofferdams and temporary trestles); temporary and permanent effects on riparian and SRA cover habitat (vegetation removal, bridge and bike path construction); and

permanent effects on aquatic habitat (construction of bridge piers, shade, and placement of RSP) in the Sacramento River.

Impacts on Delta Smelt Critical Habitat

The Sacramento River within the BSA is not included in the designated critical habitat for delta smelt, as it includes the contiguous waters of the legal Delta up to the existing I Street Bridge on the Sacramento River (59 FR 65256, December 19, 1994). Primary constituent elements of critical habitat determined to be essential to the conservation of the species are physical habitat, water, river flow, and salinity concentrations required to maintain delta smelt habitat for spawning, larval and juvenile transport, rearing, and adult migration (U.S. Fish and Wildlife Service 2006). Where it is designated, critical habitat for delta smelt consists of all water and submerged lands below ordinary high water and the entire water column, which is used by adults for migration and spawning and juveniles for rearing.

The project *is likely to adversely affect* delta smelt designated critical habitat. Although the BSA is not designated as critical habitat for delta smelt (designated critical habitat includes the Sacramento River as far upstream as the current I Street Bridge), project effects may extend far enough downstream to affect delta smelt critical habitat. Project effects with potential to affect designated critical habitat for delta smelt include temporary effects on the water column (underwater noise and sound pressure, and water quality impacts). These impacts would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.4.6.6 Avoidance and Minimization Efforts

Implementation of Measures 1–3, 5, and 23 through 30 would further avoid or minimize the potential for construction-related effects on delta smelt and designated critical habitat in the BSA.

4.4.6.7 Compensatory Mitigation

Compensation for impacts on critical habitat for winter-run Chinook salmon (Measure 31) and riparian and SRA cover habitat losses (Measure 4), as described above, also would benefit delta smelt. No further compensatory mitigation would be required.

4.4.6.8 Cumulative Impacts

Cumulative effects to delta smelt would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.4.7 Longfin Smelt

4.4.7.1 Status and Distribution

The San Francisco Bay-Delta DPS of longfin smelt is a candidate species under ESA. On April 2, 2012, USFWS announced a 12-month finding on a petition to list the Bay-Delta DPS of longfin smelt as threatened or endangered and to designate critical habitat under ESA. In its finding, USFWS announced that listing of the Bay-Delta DPS of longfin smelt is warranted but was precluded by higher priority actions to amend the Lists of Endangered and Threatened Wildlife and Plants (77 FR 19756). Upon publication of the 12-month finding, USFWS added the Bay-Delta DPS of longfin smelt to their candidate species list. In addition, USFWS intends to develop a proposed rule to the list the Bay-Delta DPS longfin smelt as priorities allow and will make any determinations on critical habitat for longfin smelt during development of the proposed rule. In the interim, USFWS will address the status of longfin smelt in its annual Candidate Notice of Review. Only the Bay-Delta DPS of longfin smelt was advanced to candidate status.

Longfin smelt was listed as a threatened species under CESA on June 26, 2009. Longfin smelt is included in the *Sacramento-San Joaquin Delta Native Fishes Recovery Plan*, which was completed in 1996 (U.S. Fish and Wildlife Service 1996).

Longfin smelt are a small, euryhaline (tolerant of a range of salinities) fish found in open waters of bays and estuaries (Moyle 2002). Longfin smelt have been collected in west coast estuaries ranging from the San Francisco estuary in California to Prince William Sound in Alaska (77 FR 19758). In California, longfin smelt also have been found in Humboldt Bay and in the estuaries of the Eel, Klamath, and Russian Rivers (77 FR 19759). In the San Francisco estuary, longfin smelt are rarely found upstream of Rio Vista on the Sacramento River and Medford Island on the San Joaquin River (Moyle 2002), although adults have been observed in the Sacramento River as far upstream as Colusa and in the San Joaquin River as far upstream as Lathrop (Merz et al. 2013). Although adults occur seasonally as far downstream as South San Francisco Bay, they are concentrated primarily in North San Francisco, San Pablo, and Suisun Bays (Moyle 2002). Longfin smelt are also common in nearshore coastal marine waters west of the Golden Gate Bridge in late summer and fall (Baxter 1999).

4.4.7.2 Life History

Bay-Delta longfin smelt are anadromous, leaving coastal marine areas and the brackish bays in fall and moving upstream to spawn in the freshwater reaches of the lower Sacramento and San Joaquin Rivers in winter and spring. Although spawning of Bay-Delta longfin smelt has not been observed, the location of spawning sites can be inferred from CDFW surveys that collect adult female and larval smelt. Based on these surveys, spawning habitat is presumed to exist in the

Cache Slough subregion (Sacramento River Deep Water Ship Channel, Cache-Liberty Island Complex), the West Delta subregion (lower Sacramento River), the eastern Suisun Bay subregion including upper Grizzly Bay, and Montezuma Slough in the Suisun Marsh subregion. Adult longfin smelt also have been observed as far upstream as Hog Slough off the South Fork Mokelumne River and in Old River south of Indian Slough during their winter and spring spawning period (77 FR 19757). Spawning rarely occurs in the San Joaquin River in the West Delta/South Delta subregions but, when it occurs, it is usually downstream of Twitchell Island (Moyle 2002). The exact location of spawning likely varies from year to year, in response to changing environmental conditions.

Adult longfin smelt may spawn as early as November and as late as June, although spawning is believed to typically occur from January through April based on the occurrence of larvae during this period and the decline in abundance of adult smelt after this period (77 FR 19757; Moyle 2002). Spawning occurs primarily over sandy or gravel substrates, rocks, and aquatic plants and when water temperatures are between 7.2 and14.4°C (45–58°F) (Moyle 2002). Most Bay-Delta longfin smelt live for 2 years, spawn, and then die, although some individuals may spawn as 1- or 3-year-olds. Some longfin smelt, mostly females, survive after spawning and live another year; it is not known whether these fish spawn more than once (Moyle 2002).

Embryos hatch in 40 days at 7.2°C (45°F); the number of days to hatching is inversely related to water temperature. Newly hatched larvae are 5–8 mm long and buoyant. The buoyant larvae move into the upper part of the water column and are carried into the estuary by river currents. During years with high Delta outflows, larvae are mostly transported to Suisun and San Pablo Bays, where survival is often better than it is during low outflow years, when larvae are mostly transported into the western Delta and Suisun Bay. Rearing habitat conditions are more favorable in Suisun and San Pablo Bays than in the Delta, where juveniles may become entrained and exposed to more adverse conditions (Moyle 2002).

4.4.7.3 Factors Affecting Abundance

Longfin smelt abundance in the Bay-Delta has declined significantly since the 1980s; over the last decade, abundance has been the lowest in the 40-year history of CDFW's monitoring surveys (77 FR 19763). Longfin smelt abundance is positively correlated with Delta outflow (Moyle 2002). Factors affecting the abundance of longfin smelt in the Bay-Delta are multiple and synergistic (Moyle 2002), and are likely to be similar to the factors affecting delta smelt.

4.4.7.4 Survey Results

Focused surveys for longfin smelt were not conducted. Longfin smelt are rarely captured in the weekly trawl surveys of the Sacramento River at Sherwood Harbor (RM 55) as part of the DJFMP (U.S. Fish and Wildlife Service 2015b). From January 2005 through March 2015, one

adult longfin smelt was captured in the trawl in December 2012, suggesting that their abundance and frequency of use of habitat in the BSA is probably very low. Longfin smelt may spawn in the BSA along shallow river margins.

4.4.7.5 Project Impacts

Project impacts on longfin smelt would be similar to those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section. However, because longfin smelt spawn in the Delta and lower Sacramento River, the proposed project also has the potential to affect spawning habitat. Because longfin smelt are not listed under ESA, no take would be associated with implementation of the project.

Impacts on Longfin Smelt Critical Habitat

Critical habitat has not been designated for longfin smelt because the species is not listed under ESA. Consequently, no impacts on longfin smelt critical habitat would result from implementation of the project.

4.4.7.6 Avoidance and Minimization Efforts

Implementation of Measures 1–3, 5, and 23 through 30 would further avoid or minimize the potential for construction-related effects to longfin smelt in the BSA.

4.4.7.7 Compensatory Mitigation

Compensation for impacts on critical habitat for winter-run Chinook salmon (Measure 31) and riparian and SRA cover habitat losses (Measure 4), as described above, also would benefit longfin smelt. No further compensatory mitigation would be required.

4.4.7.8 Cumulative Impacts

Cumulative effects to longfin smelt would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.4.8 Sacramento Splittail

4.4.8.1 Status and Distribution

Sacramento splittail was listed as threatened under ESA on February 8, 1999 (64 FR 5963). This listing was challenged by two lawsuits (*San Luis & Delta-Mendota Water Authority v. Anne Badgley et al.* and *State Water Contractors et al. v. Michael Spear et al.*). On June 23, 2000, the Federal Eastern District Court of California found the listing to be unlawful and, on September 22 of the same year, remanded the determination back to the USFWS for re-evaluation of their original listing decision. Upon further evaluation, USFWS removed Sacramento splittail from the threatened species list on September 22, 2003 (68 FR 55139). On August 13, 2009, the Center for Biological Diversity (2009) challenged the 2003 decision to remove splittail from the

threatened species list. However, on October 7, 2010, the USFWS found that listing of Sacramento splittail was not warranted (75 FR 62070).

Sacramento splittail is not listed under CESA. However, Sacramento splittail is designated by CDFW as a California species of special concern.

Sacramento splittail were endemic to the sloughs, lakes, and rivers of California's Central Valley but are now confined to the downstream reaches of the Sacramento and San Joaquin Rivers, and the Delta. In the Sacramento River, splittail range from the Delta up to the RBDD; in the San Joaquin River, they range from the Delta up to RM 135. Selected observations in the lower portions of the Sacramento River and tributaries include the American River to RM 12, the Feather River to RM 58 and to just below the Thermalito Afterbay outlet (Oppenheim pers. comm.; Seesholtz pers. comm.), and in Butte Creek/Sutter Bypass in the vicinity of Colusa State Park.

In the San Joaquin River basin, splittail have been observed in the Cosumnes, Merced, Mokelumne, and Tuolumne Rivers. Although there have been no confirmed sightings in the Stanislaus River, based on observations from other tributaries, it is assumed that splittail probably inhabit low-gradient portions of lower segments of the river.

Adult splittail are adapted for living in estuarine waters with widely fluctuating environmental conditions. They are found mostly in the Delta, Suisun Bay, Suisun Marsh, lower Napa and Petaluma Rivers, and other parts of the San Francisco estuary (Moyle 2002). In the Delta, they are most abundant in the north and west portions when the population is low; however, they are more evenly distributed in the Delta following years with more successful spawning. Like delta smelt, splittail are tolerant of salinities (commonly found at salinities between 10 and 18 ppt), although they seem to prefer lower salinities.

4.4.8.2 Life History

Adult splittail exhibit a gradual movement upstream during winter and spring, presumably to forage and spawn in flooded areas. They have been observed to leave Suisun Bay and the Delta during December through March, and it appears that the Yolo and Sutter Bypasses provide important spawning habitat in years when the bypasses are flooded (Sommer et al. 1997). Both male and female splittail become sexually mature by their second winter at about 3.9 inches (10 centimeters [cm]) in length. Female splittail are capable of producing more than 100,000 eggs per year (Daniels and Moyle 1983; Moyle et al. 1989). The adhesive eggs are deposited over flooded terrestrial or aquatic vegetation when water temperature is between 48 and 68°F (8.9 and 20°C) (Moyle 2002; Wang 1986). Splittail spawn in late April and May in Suisun Marsh and between early March and May in the upper Delta and lower reaches and flood

bypasses of the Sacramento and San Joaquin Rivers, and on the Cosumnes River Preserve (Moyle et al. 1989, 2004). Spawning has been observed to occur as early as January and may continue through early July (Wang 1986; Moyle 2002).

The diet of adults and juveniles includes decayed organic material; earthworms, clams, insect larvae, and other invertebrates; and fish. The mysid *Neomysis mercedis* is a primary prey species, although decayed organic material constitutes a larger percentage of the stomach contents (Daniels and Moyle 1983).

Larval splittail are commonly found in shallow, vegetated areas near spawning habitat. Larvae eventually move into deeper and more open-water habitat as they grow and become juveniles. Young-of-year juvenile splittail (i.e., larvae and juveniles) frequently occur in the flood bypasses when these areas are inundated during late winter and spring (Jones & Stokes Associates 1993; Sommer et al. 1997).

No population-level estimates currently exist for Sacramento splittail, but splittail are thought to be only 35–60% as numerous as they were in 1940 (Moyle 2002). The abundance of juvenile splittail (young-of-the-year) is highly variable from one year to the next; abundance is positively correlated with hydrologic conditions within the rivers and Delta during the late-winter and spring spawning period, and the magnitude and duration of floodplain inundation (Sommer et al. 1997). Because splittail are a long-lived species (5 to 7 years) (Moyle 2002; Grimaldo pers. comm.), the abundance of juveniles in a given year may not be a good predictor of adult splittail abundance. Results of CDFW fall midwater trawl surveys indicate a marked decline in overall splittail abundance and consistently low population levels since 2002. San Francisco Bay study indices also have been extremely low.

4.4.8.3 Factors Affecting Abundance

A variety of interacting factors are believed to be responsible for the long-term decline in splittail abundance. These factors include reduction in valley floor habitats; modification of spawning habitat; changes in estuarine hydraulics, especially reduced outflows; climatic variation; toxic substances; introduced aquatic species; and harvest (Moyle 2002).

4.4.8.4 Survey Results

Focused surveys for Sacramento splittail were not conducted. However, it is well documented that Sacramento splittail use the BSA as a migration corridor during upstream (adult) and downstream (juvenile) migration. In addition, Sacramento splittail may spawn in the BSA.

The temporal occurrence and relative abundance of Sacramento splittail in the BSA can be inferred based on the weekly trawl surveys of the Sacramento River at Sherwood Harbor

(RM 55) as part of the DJFMP (U.S. Fish and Wildlife Service 2015b). From January 2005 through March 2015, Sacramento splittail have been detected in the trawls in every month of the year, although most were detected in the trawls from January through May (Table 4-16).

Table 4-16. Number of Sacramento Splittail Captured by Trawl at Sherwood Harbor (RM 55) by Month (January 2005 through March 2015)

Month/ Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Monthly Total[a]
Jan	1											1
Feb	2		1	1								4
Mar	1				1	1		2		1	2	6
Apr	6						1					7
May	1	25										26
Jun									1			1
Jul		6					2					8
Aug	2	2										4
Sep						1		1				2
Oct		1										1
Nov		1										1
Dec			1									1
Annual Total	**13**	**35**	**2**	**1**	**1**	**2**	**3**	**3**	**1**	**1**	**NA**	**62**

[a] 2015 data excluded from totals.
NA = Not applicable.

4.4.8.5 Project Impacts

Project impacts on Sacramento splittail would be similar to those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section. However, because Sacramento splittail spawn along the shallow margins of the lower Sacramento River, the proposed project also has the potential to affect spawning habitat. Sacramento splittail are not listed under the ESA; therefore, no take would be associated with implementation of the project.

Impacts on Sacramento Splittail Critical Habitat

Critical habitat has not been designated for Sacramento splittail because the species is not listed under ESA. Consequently, no impacts on Sacramento splittail critical habitat would result from implementation of the project.

4.4.8.6 Avoidance and Minimization Efforts

Implementation of Measures 1–3, 5, and 23 through 30 would further avoid or minimize the potential for construction-related effects on Sacramento splittail in the BSA.

4.4.8.7 Compensatory Mitigation

Compensation for impacts on critical habitat for winter-run Chinook salmon (Measure 31) and riparian and SRA cover habitat losses (Measure 4), as described above, also would benefit Sacramento splittail. No further compensatory mitigation would be required.

4.4.8.8 Cumulative Impacts

Cumulative effects to Sacramento splittail would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.4.9 River Lamprey

4.4.9.1 Status and Distribution

River lamprey are a California species of special concern but have no other state or federal listing status (Moyle et al. 1995; 69 FR 77158). Although river lamprey is widely believed to be in decline, the species' exact status is uncertain, partly because it is often overlooked and seldom studied. Both historical and current abundance and distribution data are lacking.

River lamprey are found from San Francisco Bay in California to near Juneau, Alaska; however, detailed information on its distribution is lacking. Generally, river lamprey are associated with specific, lower portions of large river systems, including the Fraser (Canada), Columbia, Klamath, Eel, and Sacramento Rivers (69 FR 77158). In California, river lamprey occur in the lower Sacramento River, lower San Joaquin River and its tributaries (Stanislaus and Tuolumne Rivers), Salmon Creek and tributaries to the lower Russian River in Sonoma County, and the Trinity and Klamath Rivers (69 FR 77158). Historically, river lamprey have been reported in Alameda Creek, Cache Creek, Napa River, and Sonoma Creek, although the population in Cache Creek is believed to be extirpated (Moyle et al. 1995; Moyle 2002; 69 FR 77158). Precise knowledge of the distribution of river lamprey in California is limited because of a lack of data and only a basic understanding of its life history (Moyle 2002).

4.4.9.2 Life History

Limited information is available regarding the life history of this species in California, and current accounts are based largely on information from Canadian populations (Moyle 2002). River lamprey are semelparous (i.e., they die after spawning) anadromous fish with long freshwater rearing periods. Adults return to fresh water to spawn in fall and winter, but spawning usually occurs in February through May in gravely riffles (Moyle 2002). Juvenile river lamprey (ammocoetes) remain in silty backwater habitats where they filter feed on various microorganisms for approximately 3–5 years before migrating to the ocean during late spring periods after completing the transformation from ammocoete to adult (the process of metamorphosis takes 9–10 months) (Moyle et al. 1995; Moyle 2002). Adult lamprey feed on

other fish (herring and salmon) and may reach a total length of around 31 cm (12 inches) (Moyle 2002).

4.4.9.3 Factors Affecting Abundance

Trends in river lamprey populations in the Central Valley are unknown, largely because river lamprey are easily overlooked. However, it is assumed that the species has declined relative to historical levels, along with the decline in historical spawning and rearing habitat in the lower reaches of the larger rivers. (Moyle 2002.)

It is also likely that many of the same factors responsible for the long-term decline in abundance of other fish species in the Central Valley (modification of spawning and rearing habitat; changes in the timing and magnitude of river flow; climatic variation; toxic substances; and introduced aquatic species) have also negatively affected river lamprey.

4.4.9.4 Survey Results

Focused surveys for river lamprey were not conducted. Because it is difficult to identify juvenile lamprey to species, specific information on the temporal occurrence and relative abundance of river lamprey are not readily available. Based on their life history, river lamprey are likely to be present in the BSA year-round as ammocoetes (larvae) living in the soft-bottomed substrates, and seasonally as juveniles migrating to the Delta and Pacific Ocean and as adults making their way upstream toward spawning grounds.

4.4.9.5 Project Impacts

Project impacts on river lamprey would be similar to those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section. River lamprey are not listed under ESA; therefore, no take would be associated with implementation of the project.

Impacts on River Lamprey Critical Habitat

Critical habitat has not been designated for river lamprey because the species is not listed under ESA. Consequently, no impacts on river lamprey critical habitat would result from implementation of the project.

4.4.9.6 Avoidance and Minimization Efforts

Implementation of Measures 1–3, 5, and 23 through 30 would further avoid or minimize the potential for construction-related effects on river lamprey in the BSA.

4.4.9.7 Compensatory Mitigation

Compensation for impacts on critical habitat for winter-run Chinook salmon (Measure 31) and riparian and SRA cover habitat losses (Measure 4), as described above, also would benefit river lamprey. No further compensatory mitigation would be required.

4.4.9.8 Cumulative Impacts

Cumulative effects on Sacramento splittail would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.4.10 Essential Fish Habitat

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267) and the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (Public Law 109-479), requires federal agencies to consult NMFS on activities that may adversely affect EFH. Important components of EFH are substrate; water quality; water quantity, depth, and velocity; channel gradient and stability; food; cover and habitat complexity; space; access and passage; and habitat connectivity.

EFH for Chinook salmon could be affected by the project. The MSA-managed species occurring in the Sacramento River and in the BSA and potentially affected by the project include Sacramento winter-run Chinook salmon, Central Valley spring-run Chinook salmon, and fall-run and late fall–run Chinook salmon.

Effects on EFH for Pacific salmon would be similar to the impacts on species and critical habitat effects described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

The following environmental conditions potentially affect Pacific salmon EFH.

- Sedimentation and turbidity.
- Hazardous materials and contaminants.
- Disturbance and direct injury.
- Temporary and permanent loss of aquatic habitat.
- Temporary and permanent loss of SRA cover habitat.

Effects to Pacific salmon EFH associated with sedimentation and turbidity, hazardous materials and contaminants, disturbance and direct injury, and habitat loss would be temporary. Potential adverse effects to EFH of increased fine sediment and turbidity will be avoided or minimized through implementation of all applicable BMPs. The potential environmental effects of the project would be limited to short-term, localized, and minor increases in turbidity and suspended sediment. Implementation of the SWPPP along with applicable BMPs would substantially reduce or eliminate the potential for an accidental spill and unintentional discharge of contaminants with potential associated effects to EFH. Potential injury and mortality to fish associated with pile driving will be avoided or minimized by the following.

- Limiting the number and size of piles to the minimum necessary to meet the engineering and design requirements of the project.
- Using vibratory hammers whenever feasible.
- Using the smallest pile driver and minimum force necessary to complete the work.
- Using a bubble ring or similar device to minimize the magnitude and extent of potentially harmful underwater noise levels.
- Conducting pile driving only during daylight hours only.
- Limiting in-water construction to the proposed in-water construction window (May 1–November 30).

Long-term and permanent effects on EFH would be limited to the net loss of aquatic habitat (substrate, water column) associated with the new bridge piers and SRA cover habitat associated with the footprints for the bridge and bike trail footprints. However, the displacement of EFH would be insignificant compared to the total extent of EFH available to these species in the Sacramento River.

The proposed project would adversely affect EFH; however, the temporary and permanent effects would be small relative to the total EFH available in the Sacramento River. Compensation for the permanent loss of critical habitat for winter-run Chinook salmon, as described above, also would benefit EFH for Chinook salmon.

4.5 Other Protected and Managed Biological Resources

4.5.1 Migratory Birds

Several non-special-status migratory birds, including red-tailed hawk, killdeer (*Charadrius vociferous*), Anna's hummingbird (*Calypte anna*), and northern mockingbird (*Mimus polyglottos*) could nest on the ground or in shrubs or trees in and adjacent to the limits of disturbance for proposed project construction. These generally common species are locally and regionally abundant. The breeding season for most birds is generally from February 1 to August 31. Cliff swallows and white-throated swifts are known to utilize the approach structures for nesting. Cliff swallows nest from April to August and migrate south in September and October (Zeiner et al. 1990:444). White-throated swifts breed from early May to mid-August (Zeiner et al. 1990:356). The occupied nests and eggs of migratory birds are protected by federal and state laws, including the MBTA and CFCG Sections 3503 and 3503.5. USFWS is responsible for overseeing compliance with the MBTA, and CDFW is responsible for overseeing compliance with the CFGC and making recommendations on nesting bird and raptor protection.

4.5.1.1 Survey Results

Suitable nesting habitat for migratory birds is present within the cottonwood riparian forest, riparian forest/shrub wetland, ruderal woodland, and landscaped areas, and on the approach structures and buildings within the BSA.

No active nests were observed during the April 2014 and May 2015 surveys. Migratory birds observed during these surveys included great blue heron, Canada goose, white-throated swift, western scrub jay, northern mockingbird, and yellow-billed magpie.

4.5.1.2 Project Impacts

The project has the potential to affect nesting migratory birds either through direct injury or mortality during ground-disturbing activities or by disrupting normal behaviors, including nesting.

4.5.1.3 Avoidance and Minimization Efforts

Implementation of Measures 1—3, 13, 14, and 15 would avoid or reduce potential impacts on migratory birds.

4.5.1.4 Compensatory Mitigation

No compensatory mitigation is required.

4.5.1.5 Cumulative Impacts

Impacts on migratory birds would be avoided and minimized and therefore would not considerably contribute to cumulative impacts on migratory birds.

4.5.2 Bats

Bats are known to, and have the potential to, nest in built structures and trees within the BSA. California Fish and Game Code Section 4150 states that nongame mammals or parts thereof may not be taken or possessed as provided in the code or in accordance with regulations adopted by the California Fish and Game Commission, which would include common bat species.

4.5.2.1 Survey Results

The approach structures, buildings, and trees within the BSA represent potential roosting habitat for bats. Mexican free-tailed bats were observed roosting in the Jibboom Street and western I Street approach structures. A total 1,132 linear feet of roosting habitat was mapped, which consisted of 30 potential roosts on the four approach structures, 16 of which were found to be occupied by Mexican-free tailed bats. During nighttime acoustic surveys conducted in May and June 2015, Mexican free-tailed bats, big brown bats, Yuma myotis, and western red bats were detected. Big brown bats were observed night roosting in an abandoned building that is immediately west of the Jibboom Street approach structure, as confirmed by acoustic recording.

Several trees on both sides of the river had suitable habitat for foliage-roosting bats and cavity-roosting bats. No bat sign was detected in or near any of these trees.

4.5.2.2 Project Impacts

The proposed project would result in removal of the I Street and Jibboom Street approach structures. Thirty expansion joints that represent potential roosting habitat for pallid bats would be removed. Several large trees with cavities would be removed within the cottonwood riparian forest, landscaped, and ruderal woodland as part of both alternatives. Both City of West Sacramento residential access alternatives also would affect buildings on the West Sacramento side of the BSA that could be used by bats for roosting.

4.5.2.3 Avoidance and Minimization Efforts

Implementation of Measures 1–3, 13, 17, and 20 would ensure that construction activities avoid and minimize potential impacts on bats associated with construction.

4.5.2.4 Compensatory Mitigation

Implementation of Measures 20 and 21 would compensate for the loss of bat roosting habitat on the approach structures. The loss of any tree roosting habitat would be in part mitigated by Measure 4, which would restore and protect riparian habitat, and Measure 32, which would replace protected trees (described under “Protected Trees” below).

4.5.2.5 Cumulative Impacts

Because measures would be implemented to avoid and minimize potential impacts on bats, and because permanently affected bat roosting habitat would be compensated by implementation of Measure 21, the project would not contribute to cumulative effects on bats.

4.5.3 Protected Trees

A list of trees, by species, with a diameter at breast height (dbh) of 6 inches or greater was recorded for the approximate project footprint areas in the BSA (Appendix E). The City of Sacramento Heritage Tree Ordinance protects all trees with a dbh of 32 inches or greater, native oaks, California buckeye (*Aesculus californica*), western sycamore (*Platanus racemosa*), and all riparian trees with a dbh of 11.5 inches or greater. The City of West Sacramento Tree Preservation Ordinance protects all trees with a dbh of 24 inches or greater and native oaks with a dbh of 16 inches or greater.

4.5.3.1 Survey Results

Within the proposed project footprint alternatives, 93 trees meet the heritage tree ordinance criteria for the city in which they occur—approximately 22 trees in Sacramento and 71 trees in West Sacramento (Appendix E). The tree species included in this total are Oregon ash, California

black walnut, western sycamore, Fremont's cottonwood, valley oak, black willow, arroyo willow, boxelder, coast redwood, southern magnolia, tree of heaven, and black locust. Tree of heaven and black locust are invasive species, but the trees included meet the heritage tree size criterion.

4.5.3.2 Project Impacts

Construction of the proposed project with City of West Sacramento Residential Access Alternative 1 would result in removal of up to 22 heritage trees in the City of Sacramento and 71 heritage trees in the City of West Sacramento. Trees would be removed for the construction of abutments for the two fixed-span bridge approach structures on both the City of Sacramento and City of West Sacramento sides, the bikeway along Jibboom Street in Sacramento, and the C Street connection to B Street in West Sacramento.

Construction of the proposed project with City of West Sacramento Residential Access Alternative 2 would result in the removal of up to 22 heritage trees in the City of Sacramento and 45 heritage trees in the City of West Sacramento. Trees would be removed for the construction of abutments for the two fixed-span bridge approach structures on both the City of Sacramento and City of West Sacramento sides, the bikeway along Jibboom Street in Sacramento, and the C Street connection to 3rd Street in West Sacramento.

Additional temporary impacts on heritage trees could occur during construction due to trimming of trees for construction access. However, the protection measures in each city's heritage tree ordinance would be implemented to avoid impacts on protected trees outside of the permanent impact area.

The tree ordinances of the City of Sacramento and City of West Sacramento would require avoidance, minimization, and compensatory mitigation for the loss of heritage and preservation trees.

All of the protected trees within the City of Sacramento are located in the cottonwood riparian forest habitat, and mitigation for the loss of these trees would be accomplished through implementation of Measure 4 for the loss of riparian habitat. Similarly, the loss of protected trees in the City of West Sacramento that are within cottonwood riparian forest habitat would be mitigated based on the loss of riparian habitat and implementation of Measure 4. The loss of protected trees in the City of West Sacramento that are in ruderal woodland or landscaped habitat would be mitigated based on the City of West Sacramento Tree Preservation Ordinance requirements as described below in Measure 32.

4.5.3.3 Avoidance and Minimization Efforts

Implementation of Measures 1–3 would ensure that the proposed project minimizes effects on protected trees adjacent to the project construction area.

4.5.3.4 Compensatory Mitigation

Implementation of Measure 32 would compensate for the loss of protected trees in the City of West Sacramento. As noted above, all of the protected trees within the City of Sacramento are located in the cottonwood riparian forest habitat; mitigation for the loss of these trees would be accomplished through implementation of Measure 4 for the loss of riparian habitat.

Measure 32: Compensate for Loss of Protected Trees not in Riparian Habitat

Within 1 year prior to construction, the project proponent will conduct a preconstruction inventory of all heritage trees to be removed within the areas defined as ruderal woodland and landscaped land cover types. The inventory will include the location, species, diameter of all trunks, approximate height and canopy diameter, and approximate age, in support of a tree permit for removal of the heritage trees. All conditions of the tree permit will be implemented.

The project proponent will mitigate for the loss of protected trees using one or a combination of the two following options:

- Because it is unlikely that adequate space will be available in the project area for tree planting after construction, pay an in-lieu fee to the City of West Sacramento, which would be used to purchase and plant trees elsewhere in West Sacramento. Replacement trees will be required at a ratio of 1:1 (i.e., 1-inch diameter of replacement tree planted for every 1-inch diameter of tree removed). Replacement trees will be of the same species, except for the replacement of tree of heaven and black locust, which are invasive species and will be replaced with native tree species. Mitigation will be subject to approval by the City's tree administrator and will take into account species affected, replacement species, location, health and vigor, habitat value, and other factors to determine fair compensation for tree loss. Replacement trees will be monitored annually for 3 years to document vigor and survival. If any of the replacement trees die within 3 years of the initial planting, the project proponent will plant additional replacement trees and monitor them until all trees survive for a minimum of 3 years after planting.
- If feasible, plant replacement trees at or near the location of the tree removal, following the same replacement ratio, species, monitoring, and tree survival requirements described for the option above.

4.5.3.5 Cumulative Impacts

Cumulative impacts on protected trees would result from construction of other general development projects in the City of Sacramento and the City of West Sacramento. With implementation of the avoidance and minimization efforts and compensatory mitigation,

construction of the proposed project would not add to the cumulative loss of protected trees and would not result in a cumulatively adverse effect on protected trees.

4.5.4 Invasive Plants

Invasive plant species include species designated as federal noxious weeds by the USDA, species listed by the CDFA, and invasive plants identified by Cal-IPC. Invasive plants displace native species, change ecosystem processes, alter plant community structure, and lower wildlife habitat quality (California Invasive Plant Council 2006:1). Road, highway, and related construction projects are some of the principal dispersal pathways for invasive plants and their propagules. FHWA requires that state departments of transportation use the respective state's noxious weed list to identify invasive plant species that could be spread by construction of transportation projects. Accordingly, Table 3-5 lists the invasive plant species identified by CDFA and Cal-IPC that are known to occur in the BSA (Natural Resources Conservation Service 2003; California Invasive Plant Council 2006, 2007). No plant species designated as federal noxious weeds have been identified in the BSA (Natural Resources Conservation Service 2014a).

4.5.4.1 Survey Results

Table 3-5 in Chapter 3 identifies the invasive plant species located in the BSA. Invasive plant species occur in ruderal woodland; along roadways; in disturbed/graded areas; and, to a lesser extent, in riparian forest. The infestation of the BSA by these species is generally limited; they occur primarily as scattered individuals, with the exception of tree of heaven, which occurs as the main overstory in several parcels within ruderal woodland habitat between 2nd Street and the levee.

4.5.4.2 Project Impacts

The proposed project has the potential to create additional disturbed areas for a temporary period and to introduce and spread invasive plant species to uninfected areas within and adjacent to the BSA. This would be of particular concern for natural communities of special concern, where non-native invasive plants could outcompete and replace native vegetation. Implementation of Measures 1–3 and Measure 33 (described below) would help to prevent the introduction and spread of invasive plants.

4.5.4.3 Avoidance and Minimization Efforts

Implementation of Measures 1–3 and Measure 33 would ensure that the proposed project minimizes effects due to introduction and spread of invasive plants.

Measure 33: Avoid the Introduction and Spread of Invasive Plants

The project proponent or their contractor will be responsible for avoiding the introduction of new invasive plants and the spread of invasive plants previously documented in the

study area. Accordingly, the following measures will be implemented during construction.

- Educate construction supervisors and managers on weed identification and the importance of controlling and preventing the spread of invasive weeds.
- Dispose of invasive species material removed during project construction offsite at an appropriate disposal facility to avoid the spread of invasive plants into natural areas.
- Minimize surface disturbance to the greatest extent feasible to complete the work.
- Use weed-free imported erosion-control materials (or rice straw in upland areas).
- Use locally grown native plant stock and native or naturalized (noninvasive) grass seed during revegetation.
- If feasible, remove trees of heaven located in and adjacent to the temporary impact area on the east side of 2nd Street in the City of West Sacramento.

4.5.4.4 Compensatory Mitigation

Implementation of avoidance and minimization efforts would minimize or prevent the spread of invasive plants; therefore, no compensatory mitigation for invasive plant species is required.

4.5.4.5 Cumulative Impacts

Cumulative impacts caused by the spread of invasive weed species would result from other projects in Sacramento and Yolo Counties. With implementation of avoidance and minimization efforts, the proposed project is not expected to add to the cumulative spread of invasive weeds and would not result in cumulatively adverse effects related to the spread of invasive weed species.

Chapter 5 Conclusions and Regulatory Determinations

Applicable federal, state, and local permits and approvals that could be required prior to construction of the proposed project are listed in Table 5-1.

Table 5-1. Permits and Approvals Potentially Required for the Proposed Project

Permit/Approval	Approving Agency
Endangered Species Act Section 7: inter-agency consultation	U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS)
California Endangered Species Act and Section 2081(b) (Incidental Take Permit)	CDFW
Magnuson-Stevens Fishery Conservation and Management Act	NMFS
Clean Water Act (CWA) Section 404: placement of fill	U.S. Army Corps of Engineers (USACE), Sacramento District
CWA Section 401: Water Quality Certification	Central Valley Regional Water Quality Control Board
Rivers and Harbors Act of 1899 (RHA) Section 9 and General Bridge Act of 1946: Bridge Permit	U.S. Coast Guard, District 11
RHA Section 10: Permit for Work in Navigable Waters	USACE, Sacramento District
Executive Order (EO) 11990: Protection of Wetlands	Federal Highway Administration (FHWA)
EO 12962: Recreational Fisheries	FHWA
EO 13112: Prevention and Control of Invasive Species	FHWA
EO 13186: Migratory Bird Treaty Act	FHWA
Senate Bill 857: Fish Passage Assessment	CDFW
California Fish and Game Code (CFGC) Section 1602	California Department of Fish and Wildlife (CDFW)
CFGC Sections 3503 and 3503.5: protection of birds and raptors	CDFW
CFGC Sections 3511, 3513, 4700, and 5050: fully protected species	CDFW
California Code of Regulations Title 2 § 2002: Land Use Lease	State Lands Commission
Encroachment Permit	Central Valley Flood Protection Board
Approval of changes to levee	Sacramento Area Flood Control Agency
Approval of changes to levee	West Sacramento Area Flood Control Agency
Formal notification prior to construction	Sacramento Metropolitan Air Quality Management District
Formal notification prior to construction	Yolo-Solano Air Quality Management District
Heritage tree permit	City of West Sacramento

A summary of consultation and coordination efforts related to the listed permits and approvals is provided below.

5.1 Federal Endangered Species Act Consultation Summary

Inter-agency consultation with NMFS and USFWS under Section 7 of the ESA is required for potential effects of the proposed project to Central Valley steelhead (including designated critical habitat) (NMFS), Sacramento River winter-run Chinook salmon (including designated critical habitat) (NMFS), Central Valley spring-run Chinook salmon (including designated critical habitat) (NMFS), Green sturgeon (including designated critical habitat) (NMFS), Delta smelt (including designated critical habitat) (USFWS), and VELB (USFWS). To date, there has been no ESA consultation with USFWS or NMFS for the proposed project. A BA will be prepared and submitted to USFWS for VELB and Delta smelt. A Biological Opinion from the USFWS will be required. A separate BA will be prepared and submitted to NMFS for the remaining federally listed anadromous fish species listed above.

5.2 Essential Fish Habitat Consultation Summary

Consultation (informal or formal) with NMFS is required for potential effects of the project to EFH. An EFH assessment addressing Pacific salmon will be prepared jointly with the BA that is being prepared for submittal to NMFS.

5.3 California Endangered Species Act Consultation Summary

Five state-listed species, Swainson's hawk, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Delta smelt, and longfin smelt, have the potential to occur in the BSA. To date, there has been no CESA consultation with CDFW for the proposed project. A Section 2081 Incidental Take Permit may be required for Swainson's hawk, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Delta smelt, and longfin smelt because of the potential for take of these species to occur. Based on timing restrictions for pile driving (must occur during the no-migration period for listed fish species), this activity may overlap with the nesting season of Swainson's hawks. Because the BSA is in an area that historically has been occupied by nesting Swainson's hawk, there is a high likelihood that an active nest would be present within 0.25 mile of pile driving. Therefore, a Section 2081 Incidental Take Permit may be required by CDFW in order to conduct pile driving during the nesting season.

5.4 Wetlands and Other Waters Coordination Summary

To date, there has been no CWA, Porter-Cologne Act, or CFGC Section 1600 coordination for the project with the USACE, RWQCB, State Water Board, or CDFW. A delineation of waters of the United States has been conducted for the proposed project, and a delineation report (Appendix A) is pending submittal to the USACE for a preliminary jurisdictional determination. The proposed placement of temporary and permanent fill materials in a wetland and/or the Sacramento River will require a CWA Section 404 Permit, CWA Section 401 Water Quality Certification, RHA Section 9 bridge permit and Section 10 permit, CFGC Section 1602 LSAA, and Land Use Lease. With implementation of the avoidance and minimization measures described in Chapter 4, the proposed project will be in compliance with EO 11990 and will not result in a loss of wetland functions and values.

5.5 Invasive Species

Within the BSA, 32 invasive plant species (listed in Table 3-5 of Chapter 3) were identified in ruderal woodland, disturbed/graded areas, and, to a lesser extent, riparian forest habitats. None of these species are designated as federal noxious weeds by the Natural Resources Conservation Service. With implementation of the avoidance and minimization measures described in Chapter 4, the proposed project will be in compliance with EO 13112 and will not result in new, severe infestations of invasive plant species.

5.6 Other

5.6.1 Federal Migratory Bird Treaty Act

The BSA provides ground and tree nesting habitat for migratory birds. The project proponent will avoid violation of the MBTA by implementing measures identified in Chapter 4 for migratory birds, including preconstruction surveys and establishment of no-disturbance buffers around active nests.

5.6.2 Fish Passage Assessment (Senate Bill 857)

By order of Senate Bill 857, Caltrans is required to conduct a fish passage assessment for projects receiving state or federal transportation funds that affect stream crossings where anadromous salmonids are, or historically were, present. A fish passage reconnaissance assessment for the BSA was conducted on May 8, 2015, by an ICF fish biologist. The results of the fish passage reconnaissance assessment are presented in Chapter 3.

5.6.3 California Fish and Game Code

Sections 1602, 3503, 3503.5, 3511, 3513, 4700, and 5050 of the CFGC apply to the proposed project and are described below.

5.6.3.1 Section 1602: Lake or Streambed Alteration Agreements

The project proponent will enter into an LSAA with CDFW for effects within the bed and bank of the Sacramento River.

5.6.3.2 Sections 3503 and 3503.5: Protection of Birds and Raptors

The project proponent will avoid violation of CFGC Sections 3503 and 3503.5 by implementing measures identified in Chapter 4 for birds and raptors, including preconstruction surveys and establishment of no-disturbance buffers around active nests.

5.6.3.3 Sections 3511, 3513, 4700, and 5050: Fully Protected Species

The project proponent will avoid violation of CFGC Section 3511 (fully protected birds) by implementing measures identified in Chapter 4 for white-tailed kite, including preconstruction surveys and establishment of no-disturbance buffers around active nests.

5.6.4 City of Sacramento Heritage Tree Ordinance

Heritage trees in the City of Sacramento that will be preserved during project construction will be protected prior to ground-disturbing activities by installing and maintaining barrier fencing around the dripline of the tree. Removed protected trees will be mitigated at a mitigation bank with riparian habitats. With implementation of the avoidance and minimization measures described in Chapter 4, the proposed project will be in compliance with the City of Sacramento Heritage Tree Ordinance.

5.6.5 City of West Sacramento Tree Preservation Ordinance

The City of West Sacramento will comply with their Tree Preservation Ordinance by obtaining a tree permit prior to the removal or disturbance of any protected tree that would be affected within the City of West Sacramento's jurisdiction. The City of West Sacramento will implement all applicable permit conditions and comply with the required tree mitigation. Trees that will be preserved during project construction will be protected prior to ground-disturbing activities by installing and maintaining barrier fencing around the dripline of the tree. Removed protected trees in riparian habitat will be mitigated at a mitigation bank with riparian habitats, and removed protected trees in other habitats will be mitigated per the ordinance by planting replacement trees within the City of West Sacramento. With implementation of the avoidance and minimization measures described in Chapter 4, the proposed project will be in compliance with the City of West Sacramento Tree Preservation Ordinance.

Chapter 6 References

6.1 Printed References

Adams, P. B., C. B. Grimes, J. E. Hightower, S. T. Lindley, and M. L. Moser. 2002. *Status review for North American green sturgeon, Acipenser medirostris*. National Marine Fisheries Service, Santa Cruz, California.

Airola, D. A. and D. Kopp. 2009. Recent Purple Martin declines in the Sacramento region of California: recovery implications. *W. Birds* 40:254–259.

Airola, D., B. Cousens, and D. Kopp. 2014. Accelerating Decline of the Sacramento Purple Martin Breeding Population in 2014: What Are the Possible Causes? Central Valley Bird Club Bulletin 17: 12-22

Allen, P. J., B. Hodge, I. Werner, and J. J. Cech Jr. 2006. Effects of ontogeny, season, and temperature on the swimming performance of juvenile green sturgeon (*Acipenser medirostris*). *Canadian Journal of Fisheries and Aquatic Sciences* 63:1360-1369.

Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken (eds.). 2012. The Jepson Manual: Vascular Plants of California, second edition, revised. Berkeley: University of California Press.

Barr, C. B. 1991. The Distribution, Habitat, and Status of the Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus*. U.S. Fish and Wildlife Service. Sacramento, CA.

Baxter, R. D. 1999. Osmeridae. In J. Orsi (ed.). *Report on the 1980 to 1995 Fish, Shrimp and Crab Sampling in the San Francisco Estuary*. Interagency Ecological Program for the Sacramento-San Joaquin Estuary. Pages 179–216.

Baxter, R., R. Breuer, L. Brown, L. Conrad, F. Feyrer, S. Fong, K. Gehrts, L. Grimaldo, B. Herbold, P. Hrodey, A. Mueller-Solgar, T. Sommer, and K. Souza. 2010. *Interagency Ecological Program 2010 Pelagic Organism Decline Work Plan and Synthesis of Results*. Available: <www.water.ca.gov/iep/docs/FinalPOD2010Workplan12610.pdf>.

Beamesderfer, R. C. P., G. Kopp, and D. Demko. 2005. Review of the Distribution, Life History and Population Dynamics of Green Sturgeon with Reference to California's Central Valley. S.P. Cramer and Associates, Inc. Gresham, OR and Oakdale, CA.

Behnke, R. J. 1992. *Native trout of western North America*. American Fisheries Society, Bethesda, Maryland.

Bennett, W. A. 2005. Critical Assessment of the Delta Smelt Population in the San Francisco Estuary, California. *San Francisco Estuary and Watershed Science* [online serial] 3(2), Article 1.

Bisson, P. B. and R. E. Bilby. 1982. Avoidance of suspended sediment by juvenile coho salmon. North American Journal of Fisheries Management. 2: 371-374.

Brandes and McLain 2001. Juvenile Chinook salmon abundance, distribution, and survival in the Sacramento–San Joaquin Estuary. Contributions to the Biology of Central Valley Salmonids. R. L. Brown editor. California Department of Fish and Game. *Fish Bulletin* 179. Vol. 2:39–138.

CalFish. 2010. GrandTab. *Anadromous Resources Assessment* data report. March 9. Available: <http://www.calfish.org/Programs/ProgramIndex/CDFWAnadromousResourcesAssessment/tabid/213/Default.aspx>.

———. 2011. Grand Tab. *Anadromous Resources Assessment* data report. February 1. Available: <http://www.calfish.org/Programs/ProgramIndex/CDFWAnadromousResourcesAssessment/tabid/213/Default.aspx>.

———. 2012. GrandTab. *Anadromous Resources Assessment* data report. April 23. Available: <http://www.calfish.org/Programs/ProgramIndex/CDFWAnadromousResourcesAssessment/tabid/213/Default.aspx>.

California Department of Fish and Game. 1965. *California Fish and Wildlife Plan*. Volumes 1–3. Inland Fisheries Division, Sacramento, CA.

———. 1987. *Delta outflow effects on the abundance and distribution of San Francisco Bay fish and invertebrates, 1980–1985*. Exhibit 60, Proceedings of the State Water Resources Control Board 1987 water quality/water rights hearings on the San Francisco Bay/Sacramento–San Joaquin Delta.

———. 1992. 1992 Annual Report on the Status of California State-Listed Threatened and Endangered Animals and Plants. Sacramento, CA.

———. 1994. Staff Report Regarding Mitigation for Impacts to Swainson's Hawk (*Buteo swainsoni*) in the Central Valley of California. Sacramento, CA. November 1.

———. 1998. Report to the Fish and Game Commission. A Status Review of the Spring-Run Chinook salmon (*Oncorhynchus tshawytscha*) in the Sacramento River Drainage. Candidate species status report 98-01.

———. 2002. *California Department of Fish and Game comments to NMFS regarding green sturgeon listing*. Sacramento.

———. 2006. *Emergency sturgeon on regulations will take effect on Monday, March 20.* California Department of Fish and Game News Release. March 17. Available: <http://www.dfg.ca.gov/news/news06/06030.html>.

———. 2008. *California Aquatic Invasive Species Management Plan*. January 2008. Available: <http://www.dfg.ca.gov/invasives/plan/>. Accessed: February 11, 2014.

California Department of Fish and Wildlife. 2015. California Natural Diversity Database, RareFind 5, April 7, 2015. Search of the Sacramento West, Clarksburg, Saxon, Rio Linda, Sacramento East, Florin, Taylor Monument, Grays Bend, and Davis USGS 7.5-minute Quadrangles. Sacramento, CA.

California Department of Transportation. 2009. Final: technical guidance for assessment and mitigation of the hydroacoustic effects of pile driving on fish. February. Prepared by ICF Jones & Stokes and Illingworth and Rodkin, Inc. Sacramento, CA.

California Department of Water Resources. 2004. SP-T3/5 Project effects on riparian resources, wetlands, and associated floodplains. Draft final report. Oroville Facilities Relicensing FERC Project No. 2100. Available: <http://www.water.ca.gov/orovillerelicensing/>. Accessed May 5, 2014.

_____. 2005. *Fish Passage Improvement.* Bulletin 250. June 2005. Available: <http://www.water.ca.gov/fishpassage/docs/b250/B250_frontpages.pdf>.

_____. 2012a. Central Valley Flood Protection Plan: Levee Vegetation Management Strategy. DWR Division of Flood Management. March 9, 2012. Available: http://www.water.ca.gov/cvfmp/docs/CVFPP_LeveeVegMgmt_20120309.pdf. Accessed: February 16, 2015.

———. 2012b. Urban Levee Design Criteria. May 2012. Available: http://www.water.ca.gov/floodsafe/leveedesign/ULDC_May2012.pdf. Accessed: February 16, 2015.

California Invasive Plant Council. 2006. California Invasive Plant Inventory. February. (Cal-IPC Publication 2006-02.) Berkeley, CA. Available: <http://www.cal-ipc.org/ip/inventory/pdf/Inventory2006.pdf>.

———. 2007. New weeds added to Cal-IPC inventory. Cal-IPC News 15(1/2):10. Available: <http://www.cal-ipc.org/ip/inventory/pdf/WebUpdate2007.pdf>.

California Native Plant Society. 2015. Inventory of Rare and Endangered Plants (Online Edition, Version v7-15). Search of the Sacramento West, Clarksburg, Saxon, Rio Linda, Sacramento East, Florin, Taylor Monument, Grays Bend, and Davis USGS 7.5-minute Quadrangles. Available: <http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi>. Accessed: April 7, 2015.

Calkins, R. D., W. F. Durand, and W. H. Rich. 1940. *Report of the board of consultants on the fish problem of the upper Sacramento River*. Stanford University, Stanford, CA.

Carlson, T. J., M. Hastings, and A. N. Popper. 2007. Update on recommendations for revised interim sound exposure criteria for fish during pile driving activities. Memorandum to Suzanne Theiss (California Department of Transportation) and Paul Wagner (Washington Department of Transportation).

Carrasquero, J. 2001. *Overwater Structures: Freshwater Issues*. Seattle, WA: Herrera Environmental Consultants, for Washington Department of Fish and Wildlife, Washington Department of Ecology, Washington Department of Transportation.

Cavallo, B., R. Brown, and D. Lee. 2009. Hatchery and genetic management plan for Feather River Hatchery spring-run Chinook salmon program. Prepared for California Department of Water Resources. June 2009.

Cech, J. J., S. I. Doroshov, G. P. Moberg, B. P. May, R. G. Schaffter, and D. M. Kohlhorst. 2000. Biological Assessment of Green Sturgeon in the Sacramento–San Joaquin Watershed (Phase 1). Final report to CALFED Bay-Delta Program. Project # 98-C-15.

Center for Biological Diversity. 2009. *Complaint for Declaratory and Injunctive Relief.* Case filed in the United State District Court for the Northern District of California. Available: <http://www.biologicaldiversity.org/species/fish/Sacramento_splittail/pdfs/Sacramento_Splittail_complaint.pdf>.

Center for Biological Diversity, The Bay Institute, Natural Resources Defense Council. 2006. Emergency petition to list the delta smelt (*Hypomesus transpacificus*) as an endangered species under the endangered species Act. Submitted to the U.S. Fish and Wildlife Service, Washington DC and Sacramento Field Office, CA. March 8, 2006. Available: <http://www.biologicaldiversity.org/swcbd/species/deltasmelt/DS-Endangered-Petition-3-8-06.pdf>.

Central Valley Regional Water Quality Control Board. 2011. *The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region.* Fourth Edition, Revised October 2011 (with approved amendments). Available: <www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr.pdf>.

City of Sacramento. 2009. City of Sacramento 2030 General Plan. Adopted March 3, 2009. Available: < http://portal.cityofsacramento.org/Community-Development/Resources/Online-Library/General%20Plan>. Accessed: June 17, 2015.

City of West Sacramento. 2004. City of West Sacramento General Plan Policy Document. Adopted: May 3, 1990. Revised: December 8, 2004. City of West Sacramento, CA.

Colway, C., and Stevenson, D. E. 2007. Confirmed Records of Two Green Sturgeon from the Bering Sea and Gulf of Alaska. Northwestern Naturalist 88:188–192.

Cramer, S. P. and D. B. Demko. 1997. *The status of late-fall and spring Chinook salmon in the Sacramento River basin regarding the Endangered Species Act*. Special Report. Submitted to National Marine Fisheries Service on behalf of Association of California Water Agencies and California Urban Water Agencies. Prepared by S. P. Cramer and Associates, Inc., Gresham, Oregon.

Daniels, R. A. and P. B. Moyle. 1983. Life History of Splittail (*Cyprinidae: Pogonichthys macrolepidotus*) in the Sacramento-San Joaquin Estuary. *Fishery Bulletin* 81(3):647–657.

Deng, X., J. P. Van Eenennaam, and S. I. Doroshov. 2002. Comparison of early life stages and growth of green and white sturgeon. *Transactions of the American Fisheries Society* 28:237–248.

Dunk, Jeffrey R. 1995. White-Tailed Kite (*Elanus leucurus*). In The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Available: <http://bna.birds.cornell.edu/bna/species/178>.

Earley, J. T., D. J. Colby, and M. R. Brown. 2010. *Juvenile Salmonid Monitoring in Clear Creek, CA, from October 2008 through September 2009*. U.S. Fish and Wildlife Service, Red Bluff, CA.

eBird. 2015. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://www.ebird.org. (Accessed: May 12, 2015)

Environmental Laboratory. 1987. U.S. Army Corps of Engineers Wetlands Delineation Manual. (Technical Report Y-87-1.) Vicksburg, MS: U.S. Army Waterways Experiment Station.

Erickson, Gregg A. et al. 2002. *Bat and Bridges Technical Bulletin (Hitchhiker Guide to Bat Roosts)*. California Department of Transportation. Sacramento CA

Estep, J. A. 1989. Biology, Movements and Habitat Relationships of the Swainson's Hawk in the Central Valley of California, 1986–1987. California Department of Fish and Game, Nongame Bird and Mammal Section. Sacramento, CA.

Fisher, F. 1994. Past and present status of Central Valley Chinook salmon. *Conservation Biology* 8(3):870-873.

Hallock, R. J., and F. W. Fisher. 1985. *Status of the winter-run Chinook salmon,* Oncorhynchus tshawytscha*, in the Sacramento River*. Office Report. California Department of Fish and Game, Anadromous Fisheries Branch, Sacramento.

Hallock, R. J. 1987. *Sacramento River system salmon and steelhead problems and enhancement opportunities*. A report to the California Advisory Committee on Salmon and Steelhead Trout.

Hallock, R. J. 1989. *Upper Sacramento River Steelhead,* Oncorhynchus mykiss*, 1952–1988.* Report to the U.S. Fish and Wildlife Service, September 15.

Healey, M. C. 1991. Life history of Chinook salmon (Oncorhynchus tshawytscha). pp. 311–393. In C. Groot and L. Margolis, *Pacific Salmon life histories*. Vancouver, British Columbia: UBC Press. 564 pp.

Hill, K. A., and J. D. Webber. 1999. *Butte Creek spring-run Chinook salmon,* Oncorhynchus tshawytscha*, juvenile outmigration and life history 1995-1998*. Inland Fisheries Administrative Report No. 99-5. California Department of Fish and Game, Sacramento Valley and Central Sierra Region, Rancho Cordova.

ICF. 2015. Water Quality Assessment Report, I Street Bridge Replacement Project. Prepared for California Department of Transportation. August

ICF Jones and Stokes and Illingworth and Rodkin Inc. 2009. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish—Final. Prepared for California Department of Transportation: 298.

Jennings, M. R. and M. P. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. Rancho Cordova, CA: California Department of Fish and Game, Inland Fisheries Division.

Jennings, M. R., M. P. Hayes, and D. C. Holland. 1992. A petition to the U.S. Fish and Wildlife Service to place the California red-legged frog (*Rana aurora draytonii*) and the western pond turtle (*Clemmys marmorata*) on the list of endangered and threatened wildlife and plants.

Johnston, D., G. Tatarian, and E. Pierson. 2004. California Bat Mitigation Techniques, Solutions, and Effectiveness. Prepared for California Department of Transportation and California State University Sacramento Foundation. (Project Number 2394-01.) December 29.

Jones & Stokes Associates, Inc. 1993. Sutter Bypass fisheries technical memorandum II: potential entrapment of juvenile Chinook salmon in the proposed gravel mining pond. May 27, 1993. (JSA 91-272.) Sacramento, CA. Prepared for Teichert Aggregates, Sacramento, CA.

Kimmerer, W. J. 2002. Physical, Biological, and Management Responses to Variable Freshwater Flow into the San Francisco Estuary. *Estuaries* 25(6B): 1275–1290.

Kynard, B., E. Parker, and T. Parker. 2005. Behavior of early life intervals of Klamath River green sturgeon, Acipenser medirostris, with note on body color. *Environmental Biology of Fishes* 72:85-97.

Lindley, S. T., and M. S. Mohr. 2003. Modeling the effect of striped bass (*Morone saxatillis*) on the population viability of Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*). *Fisheries Bulletin* 101:321–331.

Lindley, S. T., R. S. Schick, E. Mora, P. B. Adams, J. J. Anderson, S. Greene, C. Hanson, B. P. May, D. R. McEwan, R. B. MacFarlane, C. Swanson, and J. G. Williams. 2007.

Framework for Assessing Viability of Threatened and Endangered Chinook Salmon and Steelhead in the Sacramento-San Joaquin Basin. *San Francisco Estuary and Watershed Science* 5(1). February 2007. Article 4. Available: <http://escholarship.org/uc/item/3653x9xc>.

Lloyd, D. S., J. P. Koenings, and J. D. La Perriere. 1987. Effects of turbidity in fresh waters of Alaska. *North American Journal of Fisheries Management*.

MacFarlane, R. B., S. Hayes, and B. Wells. 2008. Coho and Chinook Salmon Decline in California during the Spawning Seasons of 2007/08. National Marine Fisheries Service. Southwest Region. Santa Cruz, California.

Mayfield, R. B. and J. J. Cech, Jr. 2004. Temperature Effects on green sturgeon bioenergetics. *Transactions of the American Fisheries Society* 133:961-970.

McEwan, D. R. 2001. Central Valley Steelhead. In: R. Brown (ed.). Contributions to the Biology of Central Valley Salmonids. California Department of Fish and Game Fish Bulletin No 179.

McEwan, D., and T. A. Jackson. 1996. *Steelhead restoration and management plan for California*. Management Report. California Department of Fish and Game, Inland Fisheries Division, Sacramento.

McEwan, D., and T. A. Jackson. 1996. *Steelhead restoration and management plan for California*. Management Report. California Department of Fish and Game, Inland Fisheries Division, Sacramento.

Meehan, W. R., and T. C. Bjornn. 1991. Salmonid distributions and life histories. Pages 47–82 in W. R. Meehan, editor. *Influences of forest and rangeland management on salmonid fishes and their habitats*. American Fisheries Society Special Publication No. 19. Bethesda, Maryland.

Merz, J. E., S. Hamilton, P. S. Bergman, and B. Cavallo. 2011. Spatial perspective for delta smelt: a summary of contemporary survey data. *California Fish and Game* 97(4):164–189.

Merz, J. E., P. S. Bergman, J. F. Melgo, and S. Hamilton. 2013. *Longfin smelt: spatial dynamics and ontogeny in the San Francisco Estuary, California*. California Fish and Game 99(3):122–148.

Mills, T. J., and F. Fisher. 1994. *Central Valley anadromous sport fish annual run-size, harvest, and population estimates, 1967 through 1991*. Inland Fisheries Technical Report. California Department of Fish and Game.

Missildine, B., R. Peters, R. Piaskowski, R. Tabor. 2001. *Habitat Complexity, Salmonid Use, and Predation of Salmonids at the Bioengineered Revetment at the Maplewood Golf Course*

on the Cedar River, Washington. Miscellaneous report. U.S. Fish and Wildlife Service, Western Washington Office, Lacey, WA.

Moyle, P. 2002. Inland Fishes of California. Berkeley: University of California Press.

Moyle, P. B., J. E. Williams, and E. D. Wikramanayake. 1989. *Fish species of special concern of California*. California Department of Fish and Game. Rancho Cordova, CA.

Moyle, P. B., R. M. Yoshiyama, J. E. Williams, and E. D. Wikramanayake. 1995. Fish Species of Special Concern in California. Second Edition. Prepared for California Department of Fish and Game, Rancho Cordova. Contract No. 2128IF.

Moyle, P. B., R. D. Baxter, T. Sommer, T. C. Foin, and S. A. Matern. 2004. Biology and Population Dynamics of Sacramento Splittail (*Pogonichthys macrolepidotus*) in the San Francisco Estuary: A Review. *San Francisco Estuary and Watershed Science* [online serial] 2(2), Article 3.

Myers, J. M., R. G. Kope, B. J. Bryant, D. Teel, L. J. Lierheimer, T. C. Wainwright, W. S. Grant, F. W. Waknitz, K. Neely, S. T. Lindley, and R. S. Waples. 1998. *Status review of Chinook salmon from Washington, Idaho, Oregon, and California*. U.S. Dep. Commer., NOAA Tech. Memo NMFS-NWFSC-35, 443 p.

Nakamoto, R. J., T. T. Kisanuki, and G. H. Goldsmith. 1995. Age and growth of Klamath River green sturgeon (*Acipenser medistrostris*). Funded by U.S, Fish and Wildlife Service, Klamath River Fishery Resource Office. Yreka, CA. Project 93-FP-13.

National Invasive Species Council. 2008. 2008-2012 National Invasive Species Management Plan. Available: http://www.invasivespeciesinfo.gov/council/mp2008.pdf. August 2008. Accessed May 25, 2015.

National Marine Fisheries Service. 1993. Biological opinion addressing the potential effects on Sacramento River winter-run Chinook salmon from the operation of the Central Valley Project during 1992. National Marine Fisheries Service, Southwest Region.

———. 1996. *Factors for decline: a supplement to the notice of determination for West Coast steelhead under the Endangered Species Act*. National Marine Fisheries Service, Protected Species Branch, Portland, Oregon and National Marine Fisheries Service, Protected Species Management Division, Long Beach, California.

———. 1998. Endangered and Threatened Species: Threatened Status for Two ESUs of Steelhead in Washington, Oregon, and California. *Federal Register* 63:13347.

———. 1999. Endangered and threatened species; threatened status for two Chinook salmon evolutionarily significant units (ESUs) in California. *Federal Register* 64: 50394-50415.

———. 2000. Designated critical habitat: critical habitat for 19 evolutionarily significant units of salmon and steelhead in Washington, Oregon, Idaho, and California. *Federal Register* 65: 7764–7787.

———. 2001. Biological opinion for Sacramento River Bank Protection Project. Contract 42E: proposed levee reconstruction at river mile 149.0, Colusa County, California and five sites along the mainstem Sacramento River. Sacramento, California.

———. 2003. Endangered and threatened wildlife and plants: 12-month finding on a petition to list North American green sturgeon as a threatened or endangered species. *Federal Register* 68: 4433–4441.

———. 2005a. Endangered and threatened species; final listing determinations for 16 ESUs of West Coast salmon, and final 4(d) protective regulations for threatened salmonid ESUs. *Federal Register* 70: 37160–37204.

———. 2005b. Endangered and threatened species; designation of critical habitat for 12 Evolutionarily Significant Units of west coast salmon and steelhead in Washington, Oregon, and Idaho. *Federal Register* 70: 52630–52858.

———. 2005c. Endangered and threatened wildlife and plants: proposed threatened status for Southern Distinct Population Segment of North American green sturgeon. *Federal Register* 70: 17386–17401.

———. 2005d. *Green sturgeon (*Acipenser medirostris*) status review update*. NOAA Fisheries, Southwest Fisheries Science Center, Long Beach, California.

———. 2006a. *Biological opinion for the Sacramento River Bank Protection Project, 14 critical levee erosion repairs*. Prepared for the U.S. Army Corps of Engineers, Sacramento District, California.

———. 2006b. Endangered and threatened wildlife and plants: threatened status for southern distinct population segment of North American green sturgeon: final rule. *Federal Register* 71: 17757–17766.

———. 2009a. Biological Opinion for the Dumbarton Bridge Seismic Retrofit Project. Southwest Region, Long Beach, CA. 2009/02486.

———. 2009b. Public Draft Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the Distinct Population Segment of Central Valley Steelhead. Sacramento Protected Resources Division. October.

———. 2010. *Federal Recovery Outline, North American Green Sturgeon Southern Distinct Population Segment*. Prepared by National Marine Fisheries Service, Southwest Region. Available: <http://swr.nmfs.noaa.gov/gs/jd/Green_Sturgeon_sDPS_Recovery_Outline.pdf>.

Natural Resources Conservation Service. 2003. California State-Listed Noxious Weeds. Available: http://plants.usda.gov/java/noxious?rptType=State&sort=sciname&statefips=06. Accessed: May 26, 2015.

_____. 2014a. United States Department of Agriculture, Soil Survey Staff. Web Soil Survey. Available: http://websoilsurvey.nrcs.usda.gov/. Accessed April 7, 2015. Last updated: September 20, 2014 (Sacramento County) and September 25, 2014 (Yolo County).

———. 2014b. United States Department of Agriculture. Federal Noxious Weed List. Available: http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/weedlist.pdf. Accessed: May 26, 2015. Last Updated: October 30, 2014.

Nobriga, M. L., T. R. Sommer, F. Feyrer, and D. Fleming. 2008. Long-Term Trends in Summertime Habitat Suitability for Delta Smelt (*Hypomesus transpacificus*). *San Francisco Estuary and Watershed Science* 6(1):1–13.

Pacific Fishery Management Council. 2002. *Review of 2001 ocean salmon fisheries*. Pacific Fishery Management Council, Portland, Oregon.

_____. 2003. Pacific Coast salmon plan. Fishery management plan for commercial and recreational salmon fisheries off the coasts of Washington, Oregon, and California as revised through Amendment 14 (adopted March 1999). Portland, Oregon. September 2003.

Pierson, E. D., W. E. Rainey, and C. Corben. 2006. "Distribution and Status of Western Red Bats (*Lasiurus blossevillii*) in California." California Department of Fish and Game, Habitat Conservation Planning Branch, Species Conservation and Recovery Program Report 2006-04, Sacramento, California.

Popper, A. N., T. J. Carlson, A. D. Hawkins, B. L. Southall, and R. L. Gentry. 2006. Interim criteria for injury of fish exposed to pile driving operations: A white paper.

Popper, A. N. and M. C. Hastings. 2009. The effects of human-generated sound on fish. Integrative Zoology 4:43-52.

Raleigh, R. F., T. Hickman, R. C. Soloman, and P. C. Nelson. 1984. Habitat suitability information: rainbow trout. (Biological Report 82[10.60].) U.S. Fish and Wildlife Service. Washington DC.

Reynolds, F. L., T. Mills, R. Benthin, and A. Low. 1993. Central Valley anadromous fisheries and associated riparian and wetlands areas protection and restoration action plan. Draft. California Department of Fish and Game, Inland Fisheries Division. Sacramento, CA.

S. P. Cramer and Associates. 1995. *Central Valley Project Improvement Act anadromous fish restoration program doubling plan-recommended actions for the Mokelumne River*. Gresham, Oregon.

Sacramento Area Council of Governments. 2012–2035 Metropolitan Transportation Plan/Sustainable Communities Strategy. Available: http://sacog.org/mtpscs/. Accessed July 1, 2015.

Shuford, W. D. and T. Gardali (eds.). 2008. California Bird Species of Special Concern – a Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California. Studies of Western Birds No. 1. Western Field Ornithologists, Camarillo, CA and California Department of Fish and Game, Sacramento, CA. February 4.

Sigler, J. W., T. C. Bjornn, and F. H. Everest. 1984. Effects of chronic turbidity on densities and growth of steelheads and coho salmon. Transactions of the American Fisheries Society 113: 142-150.

Slater, D. W. 1963. *Winter-run Chinook salmon in the Sacramento River, California with notes on water temperature requirements at spawning*. Special Scientific Report—Fisheries 461. U.S. Fish and Wildlife Service.

Snider, B. and R. G. Titus. 2000. *Timing, composition, and abundance of juvenile anadromous salmonid emigration in the Sacramento River near Knights Landing, October 1996-September 1997*. California Department of Fish and Game, Habitat Conservation Division, Stream Evaluation Program Technical Report No. 00-04.

Sommer, T., R. Baxter, and B. Herbold. 1997. Resilience of splittail in the Sacramento–San Joaquin Estuary. *Transactions of the American Fisheries Society* 126:961–976.

Sommer, T. R., M. L. Nobriga, W. C. Harrell, W. Batham, and W. J. Kimmerer. 2001. Floodplain rearing of juvenile Chinook salmon: evidence of enhanced growth and survival. *Canadian Journal of Fisheries and Aquatic Sciences* 58: 325–333.

Sommer, T., C. Armor, R. Baxter, R. Breuer, L. Brown, M. Chotkowski, S. Culberson, F. Feyrer, M. Gingras, B. Herbold, W. Kimmerer, A. Mueller-Solger, M. Nobriga, and K. Souza. 2007. The Collapse of Pelagic Fishes in the Upper San Francisco Estuary. *Fisheries* 32(6):270–277.

Sommer, T., F. Mejia, M. Nobriga, F. Feyrer, and L. Grimaldo. 2011. The Spawning Migration of Delta Smelt in the Upper San Francisco Estuary. *San Francisco Estuary and Watershed Science* 9(2):1–16.

State Water Resources Control Board (SWRCB). 2011. 2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report) — Statewide. Available: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml. Accessed: April 10, 2015.Stebbins, R. C. 2003. Western reptiles and amphibians, Third Edition. New York, NY: Houghton Mifflin Company.

Stillwater Sciences. 2006. Napa River Fisheries Monitoring Program. Contract # DACW05-01-C-0015. Final report. Prepared by Stillwater Sciences, Davis, California for U.S. Army Corps of Engineers, Sacramento California.

Swainson's Hawk Technical Advisory Committee. 2000. Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley. May 31. Available: https://www.dfg.ca.gov/wildlife/nongame/raptors/swha/. Accessed July 1, 2015.

Sweeney, B. W., T. L. Bott, J. K. Jackson, L. A. Kaplan, J. D. Newbold, L. J. Standley, W. C. Hession, and R. J. Horwitz. 2004. Riparian Deforestation, Stream Narrowing, and Loss of Stream Ecosystem Services. National Academy of Sciences 101:14132–14137.

Tabor, R. A., G. S. Brown, and V. T. Luiting. 2001. The Effect of Light Intensity on Sockeye Salmon Fry Migratory Behavior and Predation by Cottids in the Cedar River, Washington. North American Journal of Fisheries Management 24: 128–145.

Talley, T. S., D. Wright, and M. Holyoak. 2006a. Assistance with the 5-Year Review of the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*). U.S. Fish and Wildlife Service. Sacramento, CA.

Talley, S. T., M. Holyoak, and D. A. Piechink. 2006b. The effects of dust on the federally threatened valley elderberry longhorn beetle. Environmental Management 37: 647-658.

The Bay Institute, Natural Resources Defense Council, and Center for Biological Diversity. 2007. Petition to the State of California Fish and Game Commission and Supporting Information for Listing the Delta Smelt (*Hypomesus transpacificus*) as an Endangered Species under the California Endangered Species Act. Available: <http://www.biologicaldiversity.org/swcbd/SPECIES/deltasmelt/ds-state-endangered-petition-02-07-2007.pdf>.

Tuvikene, A. 1995. Responses of Fish to Polycyclic Aromatic Hydrocarbons (PAHs). *Annales Zoologici Fennici* 32:295–309.

U.S. Army Corps of Engineers. 2000. *Biological assessment for the Sacramento River bank protection project; 42E, proposed levee reconstruction at river mile 149.0, Colusa County, California and at five other sites along the mainstem Sacramento River*. U.S. Army Corps of Engineers, Sacramento, California.

———. 2004. *Standard assessment methodology for the Sacramento River bank protection project*. Final report. Prepared by Stillwater Sciences, Davis, California and Dean Ryan Consultants & Designers, Sacramento, California for and in conjunction with U.S. Army Corps of Engineers and The Reclamation Board, Sacramento, California.

———. 2008. Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region (Version 2.0). ed. J. S. Wakeley, R. W. Lichvar, and C.V. Noble.

ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

———. 2014. Guidelines for landscape planting and vegetation management at levees, floodwalls, embankment dams, and appurtenant structures. Technical Letter No. ETL 1110-2-583. April. Washington, D.C.

U.S. Department of the Interior, Bureau of Reclamation. 1986. *Central Valley fish and wildlife management study*. Temperature and flow studies for optimizing Chinook salmon production, upper Sacramento River, California. Special report. Sacramento, California.

U.S. Environmental Protection Agency. 2015. Surf Your Watershed, Lower Sacramento Watershed—18020109. Available: http://cfpub.epa.gov/surf/huc.cfm?huc_code=18020109. Last updated: 5-13-15. Accessed: 5-13-15.

U.S. Fish and Wildlife Service. 1992. Shaded Riverine Aquatic Cover of the Sacramento River System: Classification as a Resource Category 1 Under the FWS Mitigation Policy. October. Fish and Wildlife Enhancement, Sacramento Field Office, Sacramento, CA.

———. 1995. *Draft anadromous fish restoration plan: a plan to increase natural production of anadromous fish in the Central Valley of California*. Prepared for the Secretary of the Interior by the U.S. Fish and Wildlife Service with assistance from the Anadromous Fish Restoration Program Core Group under authority of the Central Valley Project Improvement Act.

———.1996. Recovery plan for the Sacramento-San Joaquin Delta native fishes. Technical/Agency Draft. Prepared by Delta Native Fishes Recovery Team, U.S. Fish and Wildlife Service, Region 1, Portland, Oregon.

———.1999. *Conservation Guidelines for the Valley Elderberry Longhorn Beetle*. July 9.

———. 2004. Impacts of riprapping to aquatic organisms and river functioning, lower Sacramento River, California. Sacramento, CA. June 2004.

———. 2006. Endangered species Section 7 consultation for the U.S. Army Corps of Engineers' proposed Sacramento River bank protection project, 14 critical erosion sites along the Sacramento and Steamboat Slough, California. 1-1-07-F-0060. December.

———. 2015a. List of federal endangered and threatened species that occur in or may be affected by projects in the proposed project location. April 17, 2015.

———. 2015b. Delta juvenile fish monitoring program data. Available: <http://www.fws.gov/lodi/jfmp/>. Accessed: June 1, 2015.

———. 2015c. Guidance to Ensure Consistent and Effective Application of the U.S. Fish and Wildlife Service Mitigation Policy. Available at: <http://www.fws.gov/policy/501fw2.html>. Accessed: June 26, 2015.

Van Eenennaam, J. P., J. Linares-Casenave, X. Deng, and S. I. Doroshov. 2005. Effect of incubation temperature on green sturgeon embryos, Acipenser medirostris. *Environmental Biology of Fishes* 72:145-154.

Vogel, D. A. and K. R. Marine. 1991. *Guide to upper Sacramento River Chinook salmon life history*. Prepared by CH2M Hill, Redding, California for U.S. Bureau of Reclamation, Central Valley Project.

Wakeham, S. G., C. Schaffner, and W. Giger. 1980. Polycylic Aromatic Hydrocarbons in Recent Lake Sediments—I. Compounds Having Anthropogenic Origins. *Geochimica et Cosmochimica Acta*, 44 (3): 403–413.

Wang, J. C. S. 1986. Fishes of the Sacramento-San Joaquin estuary and adjacent waters, California: a guide to the early life histories. Technical Report 9. Prepared for the Interagency Ecological Study Program for the Sacramento-San Joaquin Estuary by California Department of Water Resources, California Department of Fish and Game, U.S. Bureau of Reclamation and U.S. Fish and Wildlife Service.

———. 1991. Early life stages and early life history of the delta smelt, Hypomesus transpacificus, in the Sacramento-San Joaquin Estuary, with comparison of early life stages of the longfin smelt, Spirinchus thaleichthys. Technical Report 28. Interagency Ecological Studies Program for the Sacramento-San Joaquin Estuary.

Wang, J. C. S., and R. L. Brown. 1993. Observations of early life stages of Delta smelt, Hypomesus transpacificus, in the Sacramento–San Joaquin Estuary in 1991, with a review of its ecological status in 1988 to 1990. Technical Report 35. November.

Waters, T. F. 1995. Sediment in streams—sources, biological effects and control. American Fisheries Society Monograph 7. Bethesda, MD. 251 pp.

Western Bat Working Group. 2004. *The Need to Conserve Bats*. Updated October 7, 2004. Available: < http://wbwg.org/conservation/needtoconserve.html>. Accessed: June 30, 2015

Western Bat Working Group. 2005. *Species Accounts.* Updated at the 2005 Portland Biennial Meeting. *Corynorhinus townsendii*, Townsend's Big-Eared Bat.

Williams, J. G. 2006. Central Valley salmon: a perspective on Chinook and steelhead in the Central Valley of California. *San Francisco Estuary and Watershed Science* 4(3): Article 2. Available at: <http://escholarship.org/uc/item/21v9x1t7#page-1>.

———. 2009. *Sacramento-San Joaquin Delta Regional Ecosystem Restoration Implementation Plan: Life-history Conceptual Model for Chinook Salmon and (*Oncorhynchus

tshawytscha and O. mykiss*)*. Sacramento-San Joaquin Delta, Regional Ecosystem Restoration Implementation Plan.

Williams, T. H, S. T. Lindley, B. C. Spence, and D. A. Boughton. 2011. Status review update for Pacific salmon and steelhead listed under the endangered species act: Southwest. 20 May 2011 – Update to 5 January 2011 report. Available: <http://www.westcoast.fisheries.noaa.gov/publications/status_reviews/salmon_steelhead/swfsc_5_year_status_review_report_2011.pdf>.

Yoshiyama, R. M., F. W. Fisher, and P. B. Moyle. 1998. Historical abundance and decline of Chinook salmon in the Central Valley region of California. *North American Journal of Fisheries Management* 18: 487–521.

Zeiner, D. C., W. F. Laudenslayer, Jr., and K. E. Mayer (eds.). 1988. California's wildlife. Volume 1: Amphibians and reptiles. California statewide wildlife habitat relationships system. Sacramento, CA: California Department of Fish and Game.

———.1990. California's wildlife. Volume 2: Birds. California statewide wildlife habitat relationships system. Sacramento, CA: California Department of Fish and Game.

6.2 Personal Communications

Grimaldo, L. California Department of Water Resources. 8–10 years of data using fin rays, unpublished data.

Oppenheim, Bruce. Biologist, National Marine Fisheries Service. September 15, 2003—E-mail report to Randall Baxter, California Department of Fish and Game, of a fresh angler-killed adult splittail thrown up on a river bank just below the Thermalito outlet.

Rea, Maria. Assistant Regional Administrator, National Marine Fisheries Service. August 20, 2015—Letter to Ms. Sue Bauer, California Department of Transportation, regarding request for technical assistance for Caltrans' proposed project to replace the I-Street Bridge over the Sacramento River.

Seesholtz, Alicia. Environmental Scientist, California Department of Water Resources. September 20, 2007—Phone conversation with Rick Wilder about fish use of the Feather River.

Sommer, Ted. Biologist, California Department of Water Resources. July 24, 2002—Personal communication with A. J. Keith, Stillwater Sciences, Berkeley, California.

Wyatt, David. Professor. Biology Department, Sacramento City College, Sacramento, California. May 7, 2015 – email.

Appendix A Wetland Delineation Report

July 16, 2015

Mr. Marc Fugler
U.S. Army Corps of Engineers
Sacramento District, Regulatory Division
1325 J Street, Room 1350
Sacramento, California 95814-2922

Subject: Request for preliminary jurisdictional determination of the delineation of the proposed I Street Bridge Project, Sacramento County and Yolo County, California

Dear Mr. Fugler:

On behalf of the City of Sacramento and the City of West Sacramento (Cities), ICF International is submitting a Request for Preliminary Jurisdictional Determination (PJD) for the Sacramento River at I Street Bridge project. The City of Sacramento, in cooperation with the City of West Sacramento and the California Department of Transportation, proposes to construct a new bridge over the Sacramento River to replace the existing vehicle crossing that is currently accommodated by the existing I Street Bridge in order to remove a series of functionally obsolete or structurally deficient bridges (i.e., approach structures). The new connection would also reduce future traffic congestion, improve operations and safety, serve multiple modes of transportation, and comply with current American Association of State Highway and Transportation Officials, Caltrans, and local agency design standards.

The Cities plan to submit a permit application for any work below OHWM or in the potential wetland. At this time, the Cities are requesting a PJD of the OHWM of the Sacramento River and the boundary of the potential wetland based on the discussion provided below and the attached delineation map (Exhibit A), photographs, and data forms.

Delineation Area

The delineation area comprises approximately 42 acres surrounding the proposed bridge and approaches (Exhibit A). The proposed bridge site is located over the Sacramento River between the Cities of Sacramento and West Sacramento, approximately 1,000 feet north of the existing I Street Bridge (Figure 1). The delineation area consists of the Sacramento River, riparian woodland, and open space with bike/pedestrian trails along the Sacramento River, local roads, elevated road (viaduct) and bridge approach structures, residential areas, and commercial

development. The delineation area has a relatively high level of historical and ongoing disturbance. Elevations in the delineation area range from -6 to 64 feet above mean sea level.

According to soil data from the Natural Resources Conservation Service, the delineation area contains the following five soil map units and water:

- Orthents-Urban land complex, 0 to 2 percent slopes (Sacramento County)
- Urban land (Sacramento County)
- Lang sandy loam (Yolo County)
- Lang sandy loam, deep (Yolo County)
- Sycamore silt loam (Yolo County)

Of these, Sycamore soils are hydric and inclusions within the map units of Orthents-Urban land and Lang sandy loam are hydric. The soil profile has been disturbed by development in West Sacramento and construction activity in the Sacramento Railyards Specific Plan area.

Methods

ICF wetland ecologist/botanist Lisa Webber conducted the field study on April 8, 2015 on behalf of the Cities in support of the proposed I Street Bridge project. The field study included investigations to identify areas that could be subject to jurisdiction by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA) and the California Department of Fish and Wildlife (DFW) and to evaluate possible environmental constraints. The investigation consisted of walking through the delineation area, mapping the observed OHWM where accessible with a sub-meter accuracy global positioning system (GPS) unit, sampling potential wetland areas using the routine on-site determination method described in the 1987 *Corps of Engineers Wetlands Delineation Manual*, and implementing the supplemental procedures and wetland indicators described in the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Arid West Region*. The wetland ecologist/botanist identified the OHWM of the Sacramento River in the field using the guidance provided in Regulatory Guidance Letter 05-05. This boundary was confirmed using site-specific topographic mapping to identify the location of the 19-foot elevation, which has been identified as the OHWM for the Sacramento River at the existing I Street bridge. Aerial and ground-view photographs of the study area were reviewed prior to the field study.

A total of four data points were examined in the delineation area—two data points to establish the riparian wetland boundary (DP-1w and DP-2u) and two data points to record upland conditions (DP-3u and DP-4u). The data forms are attached.

Results

The delineation area in the City of Sacramento east of the levee is developed, graded, or landscaped. The delineation area in the City of West Sacramento west of the levee includes residences and other buildings with landscaping, as well as ruderal woodland, which supports few native trees and predominantly tree of heaven (*Ailanthus altissima*) [FACU]. One other waters (the Sacramento River) and one potential wetland were identified in the delineation area. These features are further described below.

Other Waters—Sacramento River

The location of the OHWM in the Sacramento River was based on the elevation of 19 feet NGVD that was previously determined by the USACE at the I Street Bridge. Observations in the field further confirmed this location based on the presence of shelving, silt deposition, and wracking. The average width of the Sacramento River at the OHWM is approximately 672 feet, and the delineation area encompasses 4.877 acres of the river (Photo 1). The channel bottom is a natural substrate, presumably sand and sediment, but water turbidity prevented visual confirmation of the composition. The river banks are mostly steeply sloped and support riparian forest vegetation, with riprap near the bottom of the slope.

The cottonwood riparian community on the Sacramento River banks is predominantly mature Fremont cottonwood (*Populus fremontii*) [FAC] trees associated with valley oak (*Quercus lobata*) [FACU] and black walnut (*Juglans californica* var. *hindsii*) [FAC]. Other riparian tree species observed include Oregon ash (*Fraxinus latifolia*) [FACW], boxelder (*Acer negundo* var. *californicum*) [FACW], and black willow (*Salix gooddingii*) [FACW]. The riparian understory on the waterside of the levee is primarily rip-rap with nonnative annual grasses and forbs, however, there are also patches of more typical riparian species, such as narrow-leaf willow (*Salix exigua*) [FACW], Himalayan blackberry (*Rubus armeniacus*) [FACU], and mugwort (*Artemisia douglasiana*) [FAC].

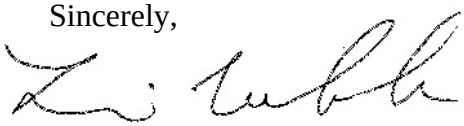
Riparian Wetland

A riparian forest/shrub wetland occurs in the delineation area within riparian habitat that meets all three federal wetland criteria (DP-1w). The riparian wetland is located in the northern portion of the delineation area on the east side of the Sacramento River within a basin (Photo 2). This basin appears to capture overflow from the Sacramento River during high flows. The vegetative composition of riparian forest/shrub wetlands is predominantly cottonwood, but also includes buttonwillow (*Cephalanthus occidentalis* var. *californicus*) [OBL], boxelder, and narrow-leaf willow. Hydric soils in the wetland met the redox depressions (F8) indicator. Wetland hydrology was indicated by observations of water marks (B1), sediment deposits (B2), and oxidized rhizospheres along living roots (C3).

The Cities request verification of the OHWM of the Sacramento River and the extent of the riparian wetland within the delineation area and a preliminary jurisdictional determination according to RGL 08-02. If you require additional information or have any questions regarding this request, please contact me at lisa.webber@icfi.com or Claire Bromund at claire.bromund@icfi.com or either of us by phone at (916) 737-3000.

Thank you for your assistance with this project.

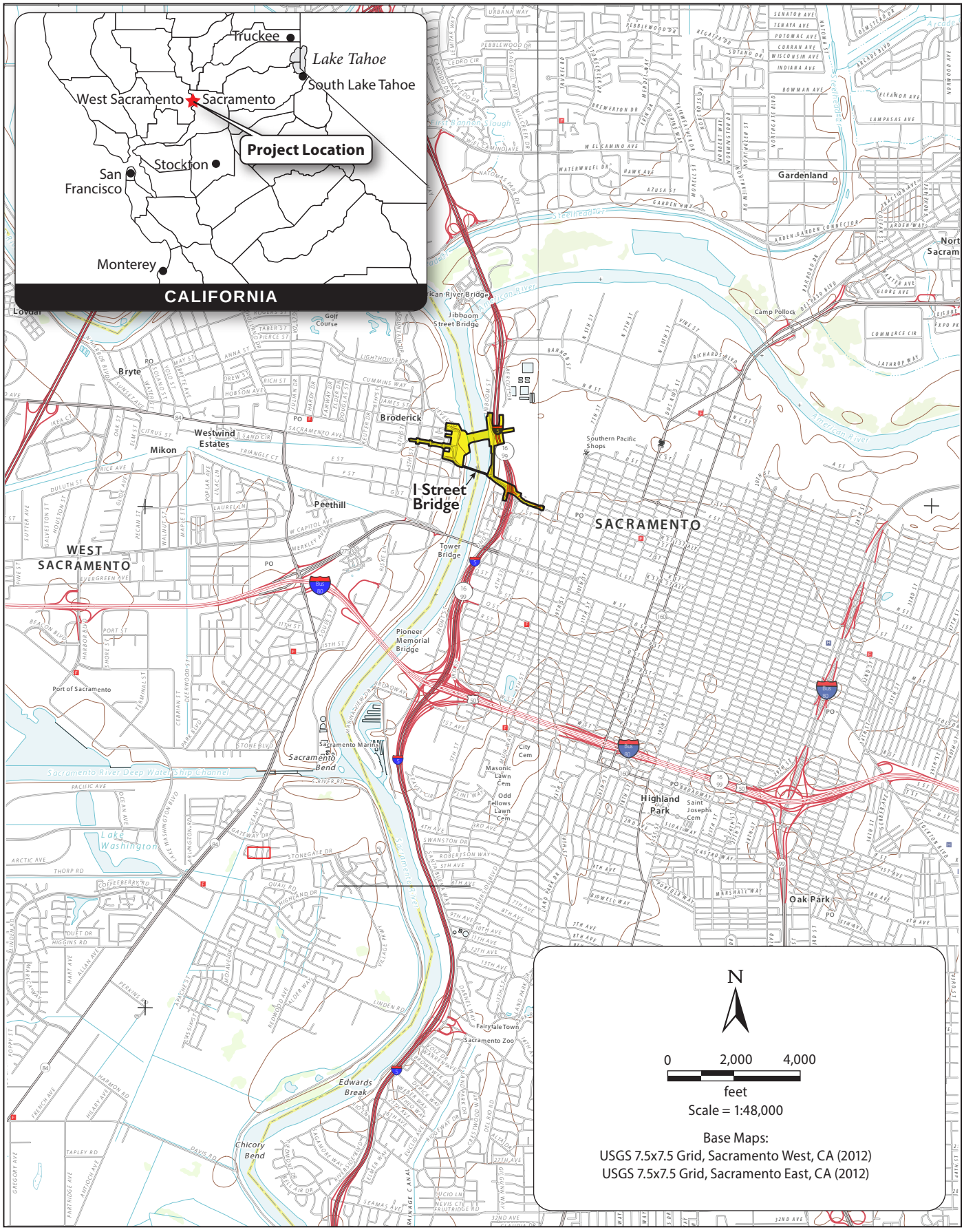
Sincerely,



Lisa Webber
Wetland Ecologist

Attachments:

- Figure 1
- Exhibit A
- Photographs
- Data Forms



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ICF INTERNATIONAL

Figure 1
Vicinity Map

121°30'30"W

121°30'20"W

121°30'10"W

38°35'20"N

DP-1w

DP-2u

DP-3u

DP-4u

Sacramento River

I Street Bridge Replacement Project
June 2015

Legend

- Delineation Area (42 Acres)
- Data Points
- OHWM
- Temporary Detention Basin

Wetlands

- Riparian Forest/Shrub Wetland (0.249 Acre)

Other Waters

- Tidal Perennial Stream (4.877 Acres)

N

0 50 100 200
Feet

1 inch = 200 feet

Notes:

Base Map Source: ICFI 2015
Imagery Source: NAIP 2014
USGS Topo Quad: Sacramento West
PLSS: New Helvetia and Wetlands Landgrants

Prepared By: ICFI/ 916.737.3000
Delineated By: L. Webber
Delineation Date: April 9th, 2015
Drawn By: A. Angier

Path: K:\Projects_1\mark_thomas\002203_14_1_St_Bridge\mapdoc\BioWetland_Delineation_20150511.mxd, Author: , Date: 6/12/2015

Exhibit A
Delineation of Potential Waters of the United States, Including Wetlands

121°31'0"W

121°30'50"W

121°30'40"W

38°35'20"N

I Street Bridge Replacement Project
June 2015

Legend

- Delineation Area (42 Acres)
- Data Points
- OHWM
- Temporary Detention Basin

Wetlands

- Riparian Forest/Shrub Wetland (0.249 Acre)

Other Waters

- Tidal Perennial Stream (4.877 Acres)

N

0 50 100 200
Feet

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Base Map Source: ICFI 2015
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Path: K:\Projects_1\mark_thomas\00203_14_I_St_Bridge\mapdoc\BioWetland_Dielneation_20150511.mxd; Author: ; Date: 6/12/2015

Exhibit A
Delineation of Potential Waters of the United States, Including Wetlands

121°30'20"W

121°30'10"W

121°30'0"W

38°35'10"N

38°35'0"N

Sacramento River

I Street Bridge Replacement Project
June 2015

Legend

- Delineation Area (42 Acres)
- Data Points
- OHWM
- Temporary Detention Basin

Wetlands

- Riparian Forest/Shrub Wetland (0.249 Acre)

Other Waters

- Tidal Perennial Stream (4.877 Acres)

N

0 50 100 200
Feet

1 inch = 200 feet

Notes:
Base Map Source: ICFI 2015
Imagery Source: NAIP 2014
USGS Topo Quad: Sacramento West
PLSS: New Helvetia and Wetlands Landgrants

Prepared By: ICFI/ 916.737.3000
Delineated By: L. Webber
Delineation Date: April 9th, 2015
Drawn By: A. Angier

Path: K:\Projects_1\mark_thomas\M0203_14_1_St_Bridge\mapdoc\BioWetland_Delineation_20150511.mxd; Author: ; Date: 6/12/2015

Exhibit A
Delineation of Potential Waters of the United States, Including Wetlands

Photo 1. View of proposed I Street Bridge site, looking from West Sacramento toward Sacramento.

Photo 2. Riparian wetland, looking down from the top of the levee slope.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: I Street Bridge City/County: Sacramento/Sac. West Sacramento/Yolo Sampling Date: 4-8-15

Applicant/Owner: City of Sacramento + City of West Sacramento State: CA Sampling Point: DP-1W

Investigator(s): Webber, Howe Section, Township, Range: T9N, R4E, unnamed section

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): <1%

Subregion (LRR): CLPR Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: La (Laang Sandy loam) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks: Extreme drought year, but ~1.0" of rainfall in the previous 24 hours.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo	10	Y	FACW
2. Cephalanthus occidentalis	30	Y	OBL
3. Populus fremontii	5	N	FAC
4.			
	45% = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 80 % Cover of Biotic Crust 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: DP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR4/2	80	10YR4/6	20	C	PL	SiCl	many roots

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none to 14"

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1) (**Nonriverine**)
- X Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): >14"

Water Table Present? Yes ___ No X Depth (inches): >14"

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >14"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area is in a basin that appears to capture overflow from the Sac. River

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: I Street Bridge City/County: Sacramento/Sac. West Sacramento/Yolo Sampling Date: 4-8-15

Applicant/Owner: City of Sacramento + City of West Sacramento State: CA Sampling Point: DP-24

Investigator(s): Webber, Howe Section, Township, Range: T9N, R4E, unnamed section

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 20

Subregion (LRR): CLRR Lat: Long: Datum:

Soil Map Unit Name: La (Lang Sandy loam) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks: Extreme drought year, but ~1" of rainfall in the previous 24 hours.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus fremontii	15	Y	FAC
2.			
3.			
4.			
	15 = Total Cover		
Sapling/Shrub Stratum (Plot size: 20')			
1. Rubus armeniacus	50%	Y	FACU
2.			
3.			
4.			
5.			
	50% = Total Cover		
Herb Stratum (Plot size: 5')			
1. Oxalis pes-caprae	5	N	UPL
2. Galium aparine	20	Y	FACU
3. Hordeum murinum	55	Y	FACU
4. Bromus diandrus	2	N	UPL
5. Bromus tectorum	2	N	UPL
6. Avena fatua	6	N	UPL
7.			
8.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: VP-2 u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					L	wood chunks + some charcoal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock

Depth (inches): 10"

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): >10"

Water Table Present? Yes ____ No X Depth (inches): >10"

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): >10"

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Site on slope above wetland basin.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: I Street Bridge City/County: Sacramento/Sac. / West Sacramento/Yolo Sampling Date: 4-8-15

Applicant/Owner: City of Sacramento & City of West Sacramento State: CA Sampling Point: DP-34

Investigator(s): Webber, Howe Section, Township, Range: T9N, R4E, unnamed section

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): slightly concave Slope (%): <1%

Subregion (LRR): CLRR Lat: Long: Datum:

Soil Map Unit Name: On boundary of La (Langsandyloam) & So (Sycamore silt loam) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No ____
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Extreme drought year, but ~1" of rainfall in the previous 24 hours.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Hordeum murinum	30	y	FACU
2. Brassica sp.	20	y	UPL
3. Matricaria discoidea	10	n	FACU
4. Medicago polymorpha	15	y	FACU
5. Geranium dissectum	10	n	UPL
6.			
7.			
8.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 15% % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: UP-3y

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 4/3	100					fsl	
6-9	2.5Y 4/3	80	7.5YR 2.5/1	20	C	PL	scl	
9-12	2.5Y 5/2	100%					c	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: clay layer

Depth (inches): 12"

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): >12"

Water Table Present? Yes _____ No X Depth (inches): >12"

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >12"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators, no surface water despite recent rain.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: I Street Bridge City/County: Sacramento/Sac. West Sacramento/Yolo Sampling Date: 4-8-15

Applicant/Owner: City of Sacramento & City of West Sacramento State: CA Sampling Point: DP-4

Investigator(s): Webber, Howe Section, Township, Range: T9N, R4E, unnamed section

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): CLPR Lat: Long: Datum:

Soil Map Unit Name: 186 (Orthents-Urban land complex, 0-2% slopes) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Extreme drought year, but ~1" of rainfall in the previous 24 hours, Located in railyard construction area.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Polypogon monspeliensis	5	N	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 95% % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x 1 =	____
FACW species	____	x 2 =	____
FAC species	____	x 3 =	____
FACU species	____	x 4 =	____
UPL species	____	x 5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Veg is sparse. Located in a disturbed construction area with fire tracks.

SOIL

Sampling Point: DP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR 4/2	100					Sil	gravel / fill

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock / fill

Depth (inches): 3-4

Hydric Soil Present? Yes ____ No X

Remarks: Site is in Sec. railyard construction area

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 2"

Water Table Present? Yes X No ____ Depth (inches): to surface

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): to surface

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology is temporary, due to construction activity and grading. Current surface water is due to recent rain.

Appendix B Database Search and Species Lists

Inventory of Rare and Endangered Plants - 7th edition interface

v7-15apr 4-6-15

Status: search results - Tue, Apr. 7, 2015, 16:16 ET b

{QUADS_123} =~ m/513D|497A|497B|512B|512C|496B|513A|513E Search

Tip: Want to search by habitat? Try the **Checkbox and Preset** search page.[all tips and help.] [search history]

Your Quad Selection: Sacramento West (513D) 3812155, Clarksburg (497A) 3812145, Saxon (497B) 3812146, Rio Linda (512B) 3812164, Sacramento East (512C) 3812154, Florin (496B) 3812144, Taylor Monument (513A) 3812165, Grays Bend (513B) 3812166, Davis (513C) 3812156

Hits 1 to 23 of 23

Requests that specify topo quads will return only Lists 1-3.

To save selected records for later study, click the ADD button.

ADD checked items to Plant Press | check all | check none

Selections will appear in a new window.

open	save	hits	scientific	common	family	CNPS
	☑	1	**Astragalus tener var. ferrisiae**	Ferris' milk-vetch	Fabaceae	List 1B.1
	☑	1	**Astragalus tener var. tener**	alkali milk-vetch	Fabaceae	List 1B.2
	☑	1	**Atriplex cordulata var. cordulata**	heartscale	Chenopodiaceae	List 1B.2
	☑	1	**Atriplex depressa**	brittlescale	Chenopodiaceae	List 1B.2
	☑	1	**Carex comosa**	bristly sedge	Cyperaceae	List 2B.1
	☑	1	**Chloropyron palmatum**	palmate-bracted bird's-beak	Orobanchaceae	List 1B.1
	☑	1	**Cuscuta obtusiflora var. glandulosa**	Peruvian dodder	Convolvulaceae	List 2B.2
	☑	1	**Downingia pusilla**	dwarf downingia	Campanulaceae	List 2B.2
	☑	1	**Etriplex joaquinana**	San Joaquin spearscale	Chenopodiaceae	List 1B.2
	☑	1	**Gratiola heterosepala**	Boggs Lake hedge-hyssop	Plantaginaceae	List 1B.2
	☑	1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
	☑	1	**Juglans hindsii**	Northern California black walnut	Juglandaceae	List 1B.1
	☑	1	**Legenere limosa**	legenere	Campanulaceae	List 1B.1
	☑	1	**Lepidium latipes var. heckardii**	Heckard's pepper-grass	Brassicaceae	List 1B.2
	☑	1	**Lilaeopsis masonii**	Mason's lilaeopsis	Apiaceae	List 1B.1
	☑	1		little mousetail	Ranunculaceae	

			Myosurus minimus ssp. apus			List 3.1
	☑	1	**Navarretia leucocephala ssp. bakeri**	Baker's navarretia	Polemoniaceae	List 1B.1
	☑	1	**Neostapfia colusana**	Colusa grass	Poaceae	List 1B.1
	☑	1	**Plagiobothrys hystriculus**	bearded popcorn-flower	Boraginaceae	List 1B.1
	☑	1	**Sagittaria sanfordii**	Sanford's arrowhead	Alismataceae	List 1B.2
	☑	1	**Symphyotrichum lentum**	Suisun Marsh aster	Asteraceae	List 1B.2
	☑	1	**Trifolium hydrophilum**	saline clover	Fabaceae	List 1B.2
	☑	1	**Tuctoria mucronata**	Crampton's tuctoria or Solano grass	Poaceae	List 1B.1

To save selected records for later study, click the ADD button.

ADD checked items to Plant Press | check all | check none

Selections will appear in a new window.

No more hits.

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Taxonomic Group is (Fish or Amphibians or Reptiles or Birds or Mammals or Mollusks or Arachnids or Crustaceans or Insects or Ferns or Gymnosperms or Monocots or Dicots or Lichens or Bryophytes) and Quad is (Sacramento West (3812155) or Sacramento East (3812154) or Clarksburg (3812145) or Saxon (3812146) or Rio Linda (3812164) or Florin (3812144) or Taylor Monument (3812165) or Grays Bend (3812166) or Davis (3812156))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Endangered	G2G3	S1S2	SSC
Ammodramus savannarum grasshopper sparrow	ABPBXA0020	None	None	G5	S2	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Archoplites interruptus Sacramento perch	AFCQB07010	None	None	G2G3	S1	SSC
Ardea alba great egret	ABNGA04040	None	None	G5	S4	
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Astragalus tener var. ferrisiae Ferris' milk-vetch	PDFAB0F8R3	None	None	G2T1	S1	1B.1
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T2	S2	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Atriplex cordulata var. cordulata heartscale	PDCHE040B0	None	None	G3T2	S2	1B.2
Atriplex depressa brittlescale	PDCHE042L0	None	None	G2	S2	1B.2
Branchinecta conservatio Conservancy fairy shrimp	ICBRA03010	Endangered	None	G1	S1	
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S2S3	
Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150	None	None	G2	S2	
Buteo regalis ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
Carex comosa bristly sedge	PMCYP032Y0	None	None	G5	S2	2B.1
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Charadrius montanus mountain plover	ABNNB03100	None	None	G3	S2?	SSC
Chloropyron palmatum palmate-bracted salty bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1	1B.1
Cicindela hirticollis abrupta Sacramento Valley tiger beetle	IICOL02106	None	None	G5TH	SH	
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T3Q	S1	
Cuscuta obtusiflora var. glandulosa Peruvian dodder	PDCUS01111	None	None	G5T4T5	SH	2B.2
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2	S2	
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	GU	S2	2B.2
Egretta thula snowy egret	ABNGA06030	None	None	G5	S4	
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Extriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Falco columbarius merlin	ABNKD06030	None	None	G5	S3S4	WL
Fritillaria agrestis stinkbells	PMLIL0V010	None	None	G3	S3	4.2
Gratiola heterosepala Boggs Lake hedge-hyssop	PDSCR0R060	None	Endangered	G2	S2	1B.2
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	PDMAL0H0R3	None	None	G5T2	S2	1B.2
Juglans hindsii Northern California black walnut	PDJUG02040	None	None	G1	S1	1B.1
Lasionycteris noctivagans silver-haired bat	AMACC02010	None	None	G5	S3S4	
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Legenere limosa legenere	PDCAM0C010	None	None	G2	S2	1B.1
Lepidium latipes var. heckardii Heckard's pepper-grass	PDBRA1M0K1	None	None	G4T2	S2	1B.2
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G3	S2S3	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Lilaeopsis masonii Mason's lilaeopsis	PDAPI19030	None	Rare	G2	S2	1B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Melospiza melodia song sparrow ("Modesto" population)	ABPBXA3010	None	None	G5	S3?	SSC
Myrmosula pacifica Antioch multilid wasp	IIHYM15010	None	None	GH	SH	
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
Neostapfia colusana Colusa grass	PMPOA4C010	Threatened	Endangered	G2	S2	1B.1
Nycticorax nycticorax black-crowned night heron	ABNGA11010	None	None	G5	S4	
Oncorhynchus mykiss irideus steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2Q	S2	
Oncorhynchus tshawytscha chinook salmon - Central Valley spring-run ESU	AFCHA0205A	Threatened	Threatened	G5	S1	
Oncorhynchus tshawytscha chinook salmon - Sacramento River winter-run ESU	AFCHA0205B	Endangered	Endangered	G5	S1	
Phalacrocorax auritus double-crested cormorant	ABNFD01020	None	None	G5	S4	WL
Plagiobothrys hystriculus bearded popcornflower	PDBOR0V0H0	None	None	G2	S2	1B.1
Plegadis chihi white-faced ibis	ABNGE02020	None	None	G5	S3S4	WL
Pogonichthys macrolepidotus Sacramento splittail	AFCJB34020	None	None	G2	S2	SSC
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	SSC
Symphyotrichum lentum Suisun Marsh aster	PDASTE8470	None	None	G2	S2	1B.2
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis gigas giant garter snake	ARADB36150	Threatened	Threatened	G2	S2	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Tuctoria mucronata Crampton's tuctoria or Solano grass	PMPOA6N020	Endangered	Endangered	G1	S1	1B.1
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	
Xanthocephalus xanthocephalus yellow-headed blackbird	ABPBXB3010	None	None	G5	S3	SSC

Record Count: 65

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
FEDERAL BUILDING, 2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
PHONE: (916)414-6600 FAX: (916)414-6713

Consultation Code: 08ESMF00-2015-SLI-0340 April 17, 2015
Event Code: 08ESMF00-2015-E-01724
Project Name: I Street Bridge Replacement

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2)

of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

The table below outlines lead FWS field offices by county and land ownership/project type. Please refer to this table when you are ready to coordinate (including requests for section 7 consultation) with the field office corresponding to your project, and send any documentation regarding your project to that corresponding office. Therefore, the lead FWS field office may not be the office listed above in the letterhead. Please visit our office's website (http://www.fws.gov/sacramento) to view a map of office jurisdictions.

Lead FWS offices by County and Ownership/Program

County	Ownership/Program	Species	Office Lead*
Alameda	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Alameda	All ownerships but tidal/estuarine	All	SFWO
Alpine	Humboldt Toiyabe National Forest	All	RFWO
Alpine	Lake Tahoe Basin Management Unit	All	RFWO
Alpine	Stanislaus National Forest	All	SFWO
Alpine	El Dorado National Forest	All	SFWO
Colusa	Mendocino National Forest	All	AFWO
Colusa	Other	All	By jurisdiction (see map)
Contra Costa	Legal Delta (Excluding ECCHCP)	All	BDFWO
Contra Costa	Antioch Dunes NWR	All	BDFWO
Contra Costa	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Contra Costa	All ownerships but tidal/estuarine	All	SFWO

El Dorado	El Dorado National Forest	All	SFWO
El Dorado	LakeTahoe Basin Management Unit		RFWO
Glenn	Mendocino National Forest	All	AFWO
Glenn	Other	All	By jurisdiction (see map)
Lake	Mendocino National Forest	All	AFWO
Lake	Other	All	By jurisdiction (see map)
Lassen	Modoc National Forest	All	KFWO
Lassen	Lassen National Forest	All	SFWO
Lassen	Toiyabe National Forest	All	RFWO
Lassen	BLM Surprise and Eagle Lake Resource Areas	All	RFWO
Lassen	BLM Alturas Resource Area	All	KFWO
Lassen	Lassen Volcanic National Park	All (includes Eagle Lake trout on all ownerships)	SFWO
Lassen	All other ownerships	All	By jurisdiction (see map)

Marin	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Marin	All ownerships but tidal/estuarine	All	SFWO
Mendocino	Russian River watershed	All	SFWO
Mendocino	All except Russian River watershed	All	AFWO
Napa	All ownerships but tidal/estuarine	All	SFWO
Napa	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Nevada	Humboldt Toiyabe National Forest	All	RFWO
Nevada	All other ownerships	All	By jurisdiction (See map)
Placer	Lake Tahoe Basin Management Unit	All	RFWO
Placer	All other ownerships	All	SFWO
Sacramento	Legal Delta	Delta Smelt	BDFWO
Sacramento	Other	All	By jurisdiction (see map)
San Francisco	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO

San Francisco	All ownerships but tidal/estuarine	All	SFWO
San Mateo	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO
San Mateo	All ownerships but tidal/estuarine	All	SFWO
San Joaquin	Legal Delta excluding San Joaquin HCP	All	BDFWO
San Joaquin	Other	All	SFWO
Santa Clara	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO
Santa Clara	All ownerships but tidal/estuarine	All	SFWO
Shasta	Shasta Trinity National Forest except Hat Creek Ranger District (administered by Lassen National Forest)	All	YFWO
Shasta	Hat Creek Ranger District	All	SFWO
Shasta	Bureau of Reclamation (Central Valley Project)	All	BDFWO
Shasta	Whiskeytown National Recreation Area	All	YFWO
Shasta	BLM Alturas Resource Area	All	KFWO

Shasta	Caltrans	By jurisdiction	SFWO/AFWO
Shasta	Ahjumawi Lava Springs State Park	Shasta crayfish	SFWO
Shasta	All other ownerships	All	By jurisdiction (see map)
Shasta	Natural Resource Damage Assessment, all lands	All	SFWO/BDFWO
Sierra	Humboldt Toiyabe National Forest	All	RFWO
Sierra	All other ownerships	All	SFWO
Solano	Suisun Marsh	All	BDFWO
Solano	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Solano	All ownerships but tidal/estuarine	All	SFWO
Solano	Other	All	By jurisdiction (see map)
Sonoma	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Sonoma	All ownerships but tidal/estuarine	All	SFWO
Tehama	Mendocino National Forest	All	AFWO
	Shasta Trinity National Forest		

Tehama	except Hat Creek Ranger District (administered by Lassen National Forest)	All	YFWO
Tehama	All other ownerships	All	By jurisdiction (see map)
Yolo	Yolo Bypass	All	BDFWO
Yolo	Other	All	By jurisdiction (see map)
All	FERC-ESA	All	By jurisdiction (see map)
All	FERC-ESA	Shasta crayfish	SFWO
All	FERC-Relicensing (non-ESA)	All	BDFWO
***Office Leads:**			
AFWO=Arcata Fish and Wildlife Office			
BDFWO=Bay Delta Fish and Wildlife Office			
KFWO=Klamath Falls Fish and Wildlife Office			
RFWO=Reno Fish and Wildlife Office			
YFWO=Yreka Fish and Wildlife Office			

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: I Street Bridge Replacement

Official Species List

Provided by:

Sacramento Fish and Wildlife Office
FEDERAL BUILDING
2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
(916) 414-6600

Non-participating U.S. Fish and Wildlife Service office(s):

The following office(s) have jurisdictions that overlap your project area, but do not provide automatically generated Species list documents. Please contact them directly to request a Species list document. Do this by visiting their website, if it is provided below. If a website is not provided, contact the office(s) by mail or phone.

San Francisco Bay-Delta Fish and Wildlife
650 CAPITOL MALL
SUITE 8-300
SACRAMENTO, CA 95814
(916) 930-5603

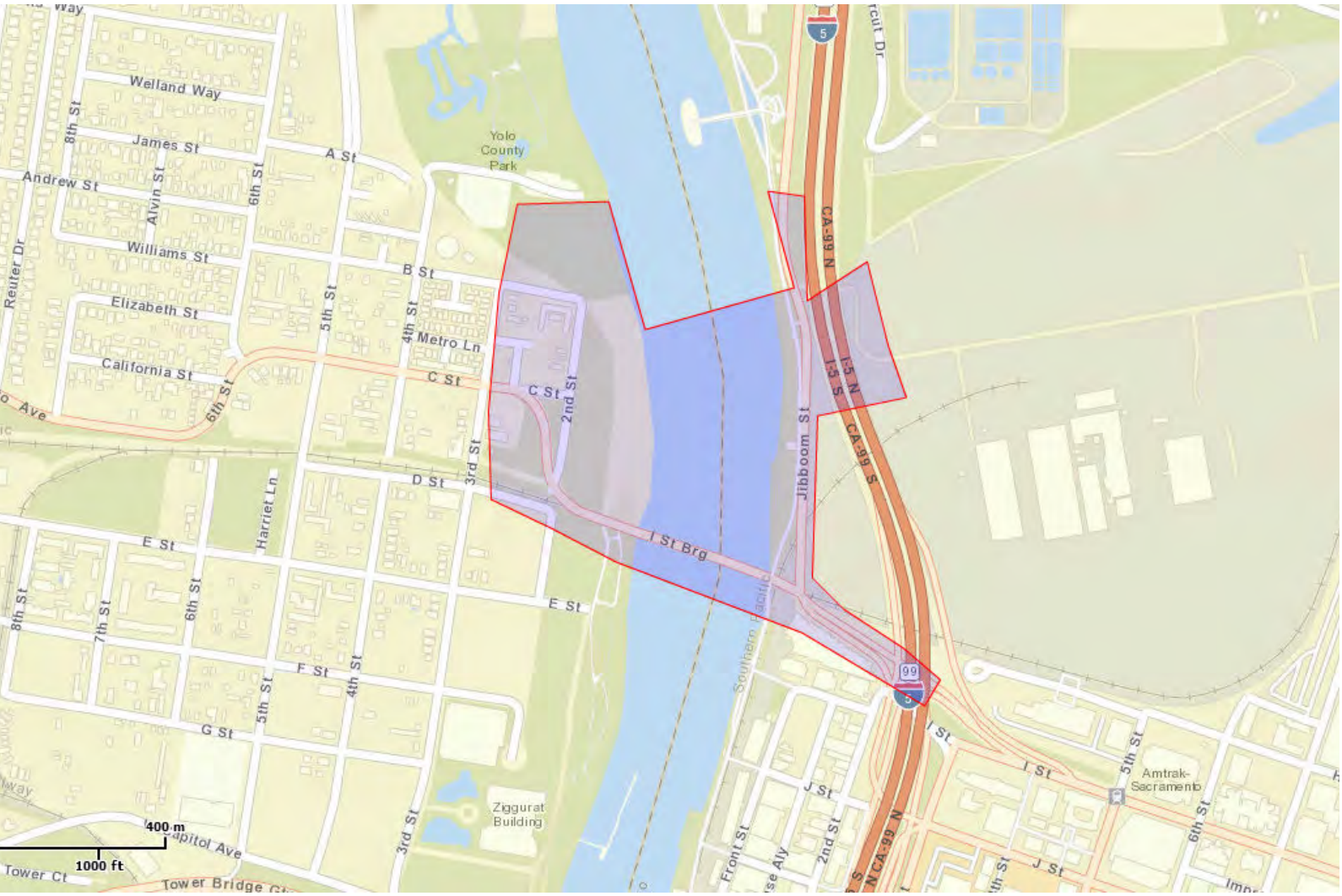
Consultation Code: 08ESMF00-2015-SLI-0340
Event Code: 08ESMF00-2015-E-01724

Project Type: Bridge Construction / Maintenance

Project Name: I Street Bridge Replacement
Project Description: Construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge and south of Richards Boulevard.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-121.5027735 38.5843329, -121.5047883 38.5852705, -121.5078353 38.5861763, -121.5098974 38.5869831, -121.5099403 38.5881236, -121.5097687 38.5896331, -121.5094683 38.5907719, -121.5079662 38.5908071, -121.5073654 38.5891635, -121.5049192 38.5897002, -121.5053484 38.5909396, -121.5047476 38.5908725, -121.5047047 38.5895308, -121.5037176 38.5900339, -121.5033743 38.5889605, -121.5030739 38.5882896, -121.504533 38.5880548, -121.5046188 38.585975, -121.5041038 38.5855725, -121.5031168 38.5850693, -121.502516 38.5846667, -121.5027735 38.5843329)))

Project Counties: Sacramento, CA | Yolo, CA

Endangered Species Act Species List

There are a total of 8 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Amphibians	**Status**	**Has Critical Habitat**	**Condition(s)**
California Tiger Salamander *(Ambystoma californiense)* Population: U.S.A. (CA - Sonoma County)	Endangered	Final designated	
California red-legged frog *(Rana draytonii)* Population: Entire	Threatened	Final designated	
Crustaceans			
Vernal Pool fairy shrimp *(Branchinecta lynchi)* Population: Entire	Threatened	Final designated	
Vernal Pool tadpole shrimp *(Lepidurus packardi)* Population: Entire	Endangered	Final designated	
Fishes			
Delta smelt *(Hypomesus transpacificus)* Population: Entire	Threatened	Final designated	
steelhead *(Oncorhynchus (=salmo)*	Threatened	Final designated	

mykiss) Population: Northern California DPS			
Insects			
Valley Elderberry Longhorn beetle *(Desmocerus californicus dimorphus)* Population: Entire	Threatened	Final designated	
Reptiles			
Giant Garter snake *(Thamnophis gigas)* Population: Entire	Threatened		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
650 Capitol Mall, Suite 5-100
Sacramento, California 95814-4700

AUG 2 0 2015

Ms. Sue Bauer
Chief, Environmental Management, M-1 Branch
Department of Transportation, District 3
703 B Street
Marysville, CA 95901

Re: Endangered Species Act (ESA) Section 7(a)(2) Species List for I Street Bridge Replacement Project

Dear Ms. Bauer:

This is in response to your July 22, 2015, letter requesting technical assistance from NOAA's National Marine Fisheries Service (NMFS) regarding the California Department of Transportation's (Caltrans) proposed project to replace the I Street Bridge over the Sacramento River between the cities of Sacramento and West Sacramento, approximately 1,000 feet north of the existing I Street Bridge, in Sacramento County, California. Waterways within the project area include the mainstem of the Sacramento River upstream of the Sacramento-San Joaquin Delta (Delta) and downstream of its confluence with the American River. Caltrans has requested NMFS to provide the species listed on the Federal List of Endangered and Threatened Wildlife (50 C.F.R. 70.11), or critical habitat designated that may occur within the project area.

Available information indicates that the following listed species and designated critical habitat could occur in the project area, or have the potential to be affected by the project (Table 1):

In addition, a comprehensive collection of species listing information, critical habitat designations, status reviews, distribution maps and Federal Register (FR) Notices for listed salmonids can be found on the NMFS West Coast Region website at: http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/salmon_and_steelhead_listings/salmon_and_steelhead_listings.html, and for green sturgeon at: http://www.westcoast.fisheries.noaa.gov/protected_species/green_sturgeon/green_sturgeon_pg.html.

Formal and informal consultation is initiated through a request that must include the following six pieces of information as described in CFR 402.14(c):

(1) A description of the proposed action to be covered;

(2) A description of the specific area that may be affected by the proposed action; Table 1—FR ESA listings for affected species and their critical habitat designations as applicable in or near the project area.

Species	ESU or DPS	Original Final FR Listing	Current Final Listing Status	Critical Habitat Designated
Chinook salmon (*Oncorhynchus tshawytscha*)	Central Valley (CV) spring-run ESU	9/16/1999 64 FR 50394 Threatened	6/28/2005 70 FR 37160 Threatened	9/2/2005 70 FR 52488
Chinook salmon (*O. tshawytscha*)	Sacramento River (SR) winter-run ESU	1/4/1994 59 FR 440 Endangered	6/28/2005 70 FR 37160 Endangered	6/16/1993 58 FR 33212
Steelhead (*O. mykiss*)	California Central Valley (CCV) DPS	3/19/1998 63 FR 13347 Threatened	1/5/2006 71 FR 834 Threatened	9/2/2005 70 FR 52488
North American (NA) Green sturgeon (*Acipenser medirostris*)	Southern DPS	4/7/2006 71 FR 17757 Threatened	4/7/2006 71 FR 17757 Threatened	10/9/2009 74 FR 52300

(3) A description of any listed species or critical habitat that may be affected by the proposed action;

(4) A description of the manner in which the action may affect any listed species or critical habitat, and an analysis of any direct, indirect, or cumulative effects.

a. Direct Effects: Effects to listed species of designated critical habitat that occur during implementation of the project.

b. Indirect Effects: Effects to listed species that occur later in time or offsite, but are reasonably certain to occur.

c. Cumulative Effects: For purposes of the ESA, cumulative effects are defined as the effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within an action area of the Federal action subject to consultation (50 CFR 402.02). Future Federal actions are not included here because they require separate consultation pursuant to Section 7 of the ESA;

(5) Relevant reports, including any environmental impact statements, environmental assessments, biological assessments or other analysis prepared regarding the proposal; and

(6) Any other relevant studies or other information available on the action, the affected listed species, or critical habitat.

The following is a description of critical habitat for SR winter-run Chinook salmon, CV spring-run Chinook salmon, and CCV steelhead in or near the project area:

Critical habitat includes the stream channels in the designated stream reaches and the lateral extent as defined by the ordinary high-waterline. In areas where the ordinary high-waterline has not been defined, the lateral extent will be defined by the bankfull elevation (defined as the level at which water begins to leave the channel and move into the floodplain; it is reached at a discharge that generally has a recurrence interval of 1 to 2 years on the annual flood series). Critical habitat for SR winter-run Chinook salmon, CV spring-run Chinook salmon, and CCV steelhead are defined as specific areas that contain the primary constituent elements (PCE) and physical habitat elements (PHE) essential to the conservation of the species. The following information discusses the inland habitat types used as PCEs for CV spring-run Chinook salmon and CCV steelhead and as PHEs for SR winter-run Chinook salmon that may occur along the Sacramento River mainstem near the project site.

PCEs for CV spring-run salmon and CCV steelhead and PHEs for SR winter-run Chinook salmon in the Sacramento River near the project site

Freshwater Rearing Habitat

Freshwater rearing sites are those with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large woody material, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks. Both spawning areas and migratory corridors comprise rearing habitat for juveniles, which feed and grow before and during their outmigration. Rearing habitat condition is strongly affected by habitat complexity, food supply, and the presence of predators of juvenile salmonids. The channelized, leveed, and riprapped river reaches and sloughs that are common in the Delta south of the project location have been significantly degraded by the placement of riprap. Freshwater rearing habitats are considered to have a high conservation value and recovery potential even if they are significantly degraded compared to their natural state.

Freshwater Migration Corridors

Ideal freshwater migration corridors are free of migratory obstructions, with water quantity and quality conditions that enhance migratory movements. They contain natural cover such as riparian canopy structure, submerged and overhanging large woody objects, aquatic vegetation, large rocks, and boulders, side channels, and undercut banks which augment juvenile and adult mobility, survival, and food supply. These corridors allow the upstream passage of adults, and the downstream emigration of outmigrant juveniles. The Sacramento River is a primary migration corridor for adult and juvenile salmon and steelhead. Freshwater migration corridors are considered to have a high conservation and recovery potential value even if they are significantly degraded compared to their natural state.

Estuarine Areas

Estuarine areas free of migratory obstructions with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh and salt water are included as a PCE. Natural cover such as submerged and overhanging large woody material, aquatic vegetation floodplains and side channels, are essential for juvenile and adult foraging. The project area is located along the Sacramento River mainstem just north of the Delta and may be a critical component of estuarine PCEs. Estuarine areas are considered to have a high conservation value as they provide factors which function to provide predator avoidance and as a transitional zone to the ocean environment. Estuarine areas are considered to have a high conservation and recovery potential value even if they are significantly degraded compared to their natural state.

The following is a description of critical habitat for the Southern DPS of NA green sturgeon in or near the project area:

Critical habitat for Southern DPS green sturgeon includes the stream channels and waterways in and near the Delta to the ordinary high waterline. There are several PCEs present that should be considered at the project location.

PCEs for the Southern DPS of NA green sturgeon in the Sacramento River near the project site

Food Resources

Abundant food items within estuarine habitats and substrates for juvenile, subadult, and adult life stages are required for the proper functioning of this PCE for green sturgeon. Prey species for juvenile, subadult, and adult green sturgeon within bays and estuaries primarily consist of benthic invertebrates and fish, including crangonid shrimp, callianassid shrimp, burrowing thalassinidean shrimp, amphipods, isopods, clams, annelid worms, crabs, sand lances, and anchovies. These prey species are critical for the rearing, foraging, growth, and development of juvenile, subadult, and adult green sturgeon within the bays and estuaries.

Water Flow

Within bays and estuaries adjacent to the Sacramento River (*i.e.*, the Delta and the Suisun, San Pablo, and San Francisco bays), sufficient flow into the bay and estuary to allow adults to successfully orient to the incoming flow and migrate upstream to spawning grounds is required. Sufficient flows are needed to attract adult green sturgeon into the Sacramento River from the bay and to initiate the upstream spawning migration into the upper river.

Water Quality

Adequate water quality, including temperature, salinity, oxygen content, and other chemical characteristics are necessary for normal behavior, growth, and viability of all life stages. Suitable water temperatures for juvenile green sturgeon should be below 24°C (75°F). At temperatures above 24°C, juvenile green sturgeon exhibit decreased swimming performance and increased cellular stress. Adequate levels of dissolved oxygen (DO) are also required to support

oxygen consumption by juveniles (ranging from 61.8 to 76.1 mg O_2 hr^{-1} kg^{-1}). Suitable water quality also includes water free of contaminants (*e.g.*, organochlorine pesticides, polyaromatic hydrocarbons (PAHs), or elevated levels of heavy metals) that may disrupt the normal development of juvenile life stages, or the growth, survival, or reproduction of subadult or adult stages.

Migratory Corridor

Safe and unobstructed migratory pathways are necessary for successful and timely passage of adult, sub-adult, and juvenile fish within the region's different estuarine habitats and between the upstream riverine habitat and the marine habitats. Within the waterways comprising the Delta, and bays downstream of the Sacramento River, safe and unobstructed passage is needed for juvenile green sturgeon during the rearing phase of their life cycle. Rearing fish need the ability to freely migrate from the river through the estuarine waterways of the Delta and bays and eventually out into the ocean. Passage within the bays and the Delta is also critical for adults and subadults for feeding and summer holding, as well as to access the Sacramento River for their upstream spawning migrations and to make their outmigration back into the ocean. Within bays and estuaries outside of the Delta and the areas comprised by Suisun, San Pablo, and San Francisco bays, safe and unobstructed passage is necessary for adult and subadult green sturgeon to access feeding areas, holding areas, and thermal refugia, and to ensure passage back out into the ocean.

Water Depth

A diversity of depths is necessary for shelter, foraging, and migration of juvenile, subadult, and adult life stages. Adults and subadults within the estuary primarily occupy waters over shallow depths of less than 10 meters, either swimming near the surface or foraging along the bottom. In a study of juvenile green sturgeon in the Delta, relatively large numbers of juveniles were captured primarily in shallow waters from 3 to 8 feet deep, indicating juveniles may require shallower depths for rearing and foraging. Thus, a diversity of depths is important to support different life stages and habitat uses for green sturgeon within estuarine areas.

Sediment Quality

Sediment quality (*i.e.*, chemical characteristics) is necessary for normal behavior, growth, and viability of all life stages. This includes sediments free of contaminants (*e.g.*, elevated levels of selenium, PAHs, and organochlorine pesticides) that can cause negative effects on all life stages of green sturgeon.

Essential Fish Habitat (EFH)

The proposed project site is within the region identified as EFH for Pacific salmon in Amendment 14 of the Pacific Salmon FMP. EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purposes of interpreting the definition of EFH, "waters" includes aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used

by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means habitat required to support a sustainable fishery and a healthy ecosystem; and, "spawning, breeding, feeding, or growth to maturity" covers all habitat types used by a species throughout its life cycle. In order to protect EFH, federal agencies are required to consult with NMFS on activities that may adversely affect EFH, and NMFS must provide EFH conservation recommendations to those agencies (section 305(b)(4)(A)).

Fall-run Chinook salmon have the potential to be present near the project location and are managed under the Pacific Coast Salmon Fisheries Management Plan (FMP). Habitat areas of particular concern (HAPCs), as designated under this FMP, include (1) complex channels and floodplain habitats, (2) thermal refugia, (3) spawning habitat, (4) estuaries, and (5) marine and estuarine submerged aquatic vegetation. Caltrans should identify and discuss HAPCs present, if any, along the Sacramento River mainstem near the project location.

ESA Section 7(a)(1) Conservation Recommendations

Section 7(a)(1) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C 1531 *et seq.*), directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. Conservation recommendations are discretionary agency activities intended to minimize or avoid adverse effects of a proposed project on listed species or critical habitat, to help implement recovery plans, or to develop information.

Bridge replacement projects have a high potential to further degrade habitat for anadromous fish and reduce their recovery potential. We recommend a pre-consultation meeting to discuss methods to minimize and avoid impacts of this project, including project timing. Some examples include:

(1) Re-vegetate onsite at a 3:1 ratio immediately following the completion of the proposed project for any area consisting of removed or disturbed vegetation with native riparian species in efforts to facilitate the development of shaded riverine aquatic (SRA) habitat. A detailed re-vegetation plan should be provided and should include a list of species and designs depicting the proposed location for each species and their density. The vegetation plan should also include proposed irrigation and vegetation monitoring schedules which will likely be needed for several years;

(2) Develop a monitoring plan to evaluate the success of the re-vegetation efforts which would indicate the overall performance of the planted vegetation at each site and include guidelines for replacing vegetation that fail to establish.

(3) Purchase rearing habitat credits at a 3:1 ratio for the placement of rock slope protection (RSP), if used, within the action area at a NMFS approved anadromous fish conservation bank;

(4) Implement best management practices, including Storm Water Pollution Prevention Program and Water Pollution Control Program, to minimize effects to federally listed fish and their designated critical habitat;

(5) Use a soil-rock mixture to facilitate re-vegetation of the proposed project area. A ratio of rock to soil (70:30) is recommended. We suggest a soil-rock mixture on top of the rock revetment to allow native riparian vegetation to be planted to ensure SRA habitat is replaced;

(6) Caltrans should use a vibratory hammer whenever possible to avoid acoustic impacts to ESA-listed fish when pile driving. If an impact hammer is necessary, a bubble curtain or other sound attenuation method should be used to reduce impacts;

(7) Construction should occur when vulnerable life stages of listed anadromous fish would be least likely to occur in the project area;

(8) To address potential fish migration concerns upstream and downstream of the RSP placement points, see NMFS Guidelines for Salmonid Passage at Stream Crossings at http://www.westcoast.fisheries.noaa.gov/publications/hydropower/fish_passage_at_stream_crossings_guidance.pdf.;

(9) Minimize bridge demolition impacts by removing the existing superstructure piece by piece and disposing of it in an environmentally conscious way off-site. This includes protecting the river below the bridge by routing any flow around the construction area;

(10) Stabilize and restore the affected project footprint area by applying appropriate soil stabilization and re-vegetation techniques. This may include the implementation of riparian plantings and locally native grass and/or forb seeds to reduce and offset construction impacts. Seeded areas should be covered with broadcast straw and/or seeded erosion control blankets;

(11) Caltrans should continue to work cooperatively with other State and Federal agencies, private landowners, governments, and local watershed groups to identify opportunities for cooperative analysis and funding to support salmonid and sturgeon habitat restoration projects within the Sacramento River watershed;

(12) Caltrans and other local, State, and Federal agencies should provide training for Caltrans environmental and engineering staff that will assist in avoiding or minimizing the impacts of transportation projects on ESA-listed salmonids, NA green sturgeon and their designated critical habitats; and

(13) Caltrans should purchase salmonid habitat restoration credits at a NFMS-approved anadromous fish conservation bank at a 3:1 ratio for the footprint of the project area. The purchase of credits is consistent with 7(a)(l) because it will result in the restoration and long-term preservation of valuable habitat attributes that will improve the survival and recovery of the species.

This response is provided as technical assistance with Caltrans. This response is not intended to take the place of formal comments or consultation as required under the ESA, and does not provide incidental take authorization pursuant to section 7(b)(4) and section 7(o)(2) of the ESA.

Please contact Dylan Van Dyne at (916) 930-3625, or via e-mail at Dylan.VanDyne@noaa.gov if you have any questions or require additional information.

Sincerely,

for Maria C. Rea
Assistant Regional Administrator,
California Central Valley Area Office

Cc: Chron File: ARN 151422-WCR2015-SA00159

Appendix C Representative Photographs

Appendix C Representative Photographs

Photo 1. Sacramento River and riparian habitat, looking east

Photo 2. Sacramento River and riparian habitat, looking west

Photo 3. Riparian forest/shrub wetland

Photo 4. Riparian forest/shrub wetland

Photo 5. Ruderal woodland west of bridge ramp

Photo 6. Ruderal woodland on north side of C Street

Photo 7. Ruderal woodland east of bridge ramp

Photo 8. Landscaped at edge of Bercut Drive

Photo 9. Developed/Graded under I-5

Photo 10. Underside of Jibboom Street viaduct

Appendix D Plant Species Observed in the Biological Study Area

Appendix D Plant Species Observed in the Biological Study Area

Scientific Name	Common Name
Acer negundo var. *californicum*	Box elder
Acer saccharinum	Silver maple
*Ailanthus altissima**	Tree of heaven
Alnus rhombifolia	White alder
Amaranthus blitoides	Prostrate pigweed
Ambrosia psilostachya	Western ragweed
Amsinckia intermedia	Common fiddleneck
Artemisia douglasiana	Mugwort
*Avena fatua**	Wild oat
*Brassica nigra**	Black mustard
*Bromus diandrus**	Ripgut brome
*Bromus hordeaceus**	Soft chess
Bromus madritensis ssp. *rubens**	Red brome
*Bromus tectorum**	Cheatgrass
Capsella bursa-pastoris	Shepherd's purse
*Carduus pycnocephalus**	Italian thistle
Carex barbarae	Santa Barbara sedge
Celtis australis	European hackberry
*Centaurea solstitialis**	Yellow star-thistle
Cephalanthus occidentalis var. *californicus*	Common buttonbush
Cerastium fontanum	Mouse ear chickweed
Claytonia perfoliata	Miner's lettuce
Collinsia concolor	Chinese houses
*Convolvulus arvensis**	Bindweed
Cotula australis	Australian brass buttons
Crassula connata	Pygmy weed
Cupressus sempervirens	Italian cypress
*Cynodon dactylon**	Bermuda grass
Epilobium ciliatum	Fringed willowherb
Equisetum arvense	Horsetail
Erigeron canadensis	Horseweed
Eriobotrya japonica	Loquat
Erodium botrys	Big heronbill
*Erodium cicutarium**	Red stemmed filaree

Scientific Name	Common Name
Eschscholzia californica	California poppy
Festuca myuros [*Vulpia myuros*]*	Rattail six weeks grass
Festuca perennis [*Lolium perenne*]*	Italian ryegrass
*Ficus carica**	Edible fig
*Foeniculum vulgare**	Sweet fennel
Fraxinus latifolia	Oregon ash
Galium aparine	Common bedstraw
*Geranium dissectum**	Cutleaf geranium
Gnaphalium palustre	Lowland cudweed
*Hedera helix**	English ivy
*Helminthotheca echioides**	Bristly ox-tongue
Hordeum murinum ssp. *leporinum**	Foxtail barley
*Hypochaeris radicata**	Rough cat's ear
Juglans californica var. *hindsii*	Black walnut
Juncus effusus ssp. *pacificus*	Pacific rush
Lactuca serriola	Prickly lettuce
Lasthenia glabrata ssp. *glabrata*	Yellow-ray goldfields
Leontodon taraxicoides	Dandelion
*Lepidium latifolium**	Perennial peppergrass
Lepidium nitidum	Shining pepperweed
Logfia gallica	Narrowleaf cottonrose
Lupinus bicolor	Bicolor lupine
Magnolia grandiflora	Southern magnolia
Malva parviflora	Cheeseweed
Matricaria discoidea	Pineapple weed
Medicago sativa	Alfalfa
Melilotus alba	White sweetclover
Melilotus indicus	Yellow sweetclover
Mimulus guttatus	Monkeyflower
Nerium oleander	Oleander
*Nicotiana glauca**	Tree-tobacco
*Oxalis pes-caprae**	Sourgrass
Parthenocissus quinquefolia	Virginia creeper
Phacelia parryi	Parry's phacelia
Phoradendron macrophyllum	Big-leaf mistletoe
Pinus sp.	Pine
Pittosporum toriba	Mock orange
*Plantago lanceolata**	English plantain
Platanus x *hispanica*	London plane tree

Scientific Name	Common Name
Platanus racemosa	Western sycamore
Poa annua	Annual bluegrass
Polygonum arenastrum ssp. *depressum*	Common knotweed
*Polypogon monspeliensis**	Rabbitsfoot grass
Populus fremontii ssp. *fremontii*[2]	Fremont cottonwood
Prunus sp.	Fruit tree
Pyrus calleryana	Callery pear
Quercus lobata	Valley oak
Raphanus raphanistrum	Jointed charlock
*Raphanus sativus**	Wild radish
*Robinia pseudoacacia**	Black locust
Rosa canina	Dog rose
Rubus armeniacus [*discolor*]*	Himalayan blackberry
*Rumex crispus**	Curly dock
Salix exigua	Sandbar willow
Salix gooddingii	Black willow
Sambucus nigra ssp. *caerulea* [*mexicana*]	Blue elderberry
Senecio vulgaris	Old man of spring
Sequoia sempervirens	Coast redwood
*Sesbania punicea**	Purple river-hemp
*Silybum marianum**	Milk-thistle
*Sisymbrium irio**	London rocket
Solanum americanum	Common nightshade
Sonchus oleraceus	Common sow thistle
*Sorghum halepense**	Johnsongrass
Spergularia macrotheca	Sticky sandspurry
Stipa miliacea [*Piptatherum miliaceum*]*	Smilo grass
*Tribulus terrestris**	PunctureVine
*Trifolium hirtum**	Rose clover
Triticum aestivum	Common wheat
Urtica urens	Dwarf nettle
Verbascum blatteria	Moth mullein
Verbena bonariensis	Purpletop vervain
Veronica peregrine ssp. *xalapensis*	Hairy purslane speedwell
Vicia benghalensis	Purple vetch
Vicia sativa ssp. *sativa*	Spring vetch
Vicia villosa ssp. *varia*	Winter vetch

Scientific Name	Common Name
*Vinca major**	Periwinkle
Vitis californica	California wild grape
Washingtonia filifera	California fan palm

*Invasive species on CalIPC and/or CDFA lists (CalIPC 2006, 2007)

Appendix E Protected Trees in the I Street Bridge Project Footprint

Appendix E Protected Trees in the I Street Bridge Project Footprint

Tree Species	Estimated Diameter at Breast Height (inches)[1]
West Sacramento, Common Impact Areas	
Fremont's cottonwood	40
Fremont's cottonwood	36 + 36
Fremont's cottonwood	36
Fremont's cottonwood	48 + 24
Fremont's cottonwood	60
Fremont's cottonwood	24
Oregon ash	24 + 18 + 12
California black walnut	12 + 12 + 12 + 12
California black walnut	36
Fremont's cottonwood	36
Valley oak	28
Valley oak	12 + 16
Fremont's cottonwood	24
Fremont's cottonwood	18 + 12
Valley oak	8 + 8 + 6
Valley oak	18
Fremont's cottonwood	24
Fremont's cottonwood	36
Fremont's cottonwood	24
California black walnut	36
Tree of heaven	12 + 10 + 8 + 8 + 8 + 8
Tree of heaven	12 + 12
Tree of heaven	12 + 8
Tree of heaven	12 + 12
Tree of heaven	12 + 8
Tree of heaven	24
Tree of heaven	24 + 12 + 18 + 18 +12
Tree of heaven	24
Tree of heaven	24 + 24 + 24 + 18
Fremont's cottonwood	24
California black walnut	36 +24
Tree of heaven	24 + 24 + 12
Magnolia	24 + 10
Boxelder	16 + 12 + 12
Valley oak	24
Valley oak	24
Silver maple	36
Valley oak	24
Valley oak	30
Valley oak	18
Valley oak	18
Valley oak	36
London plane tree	24

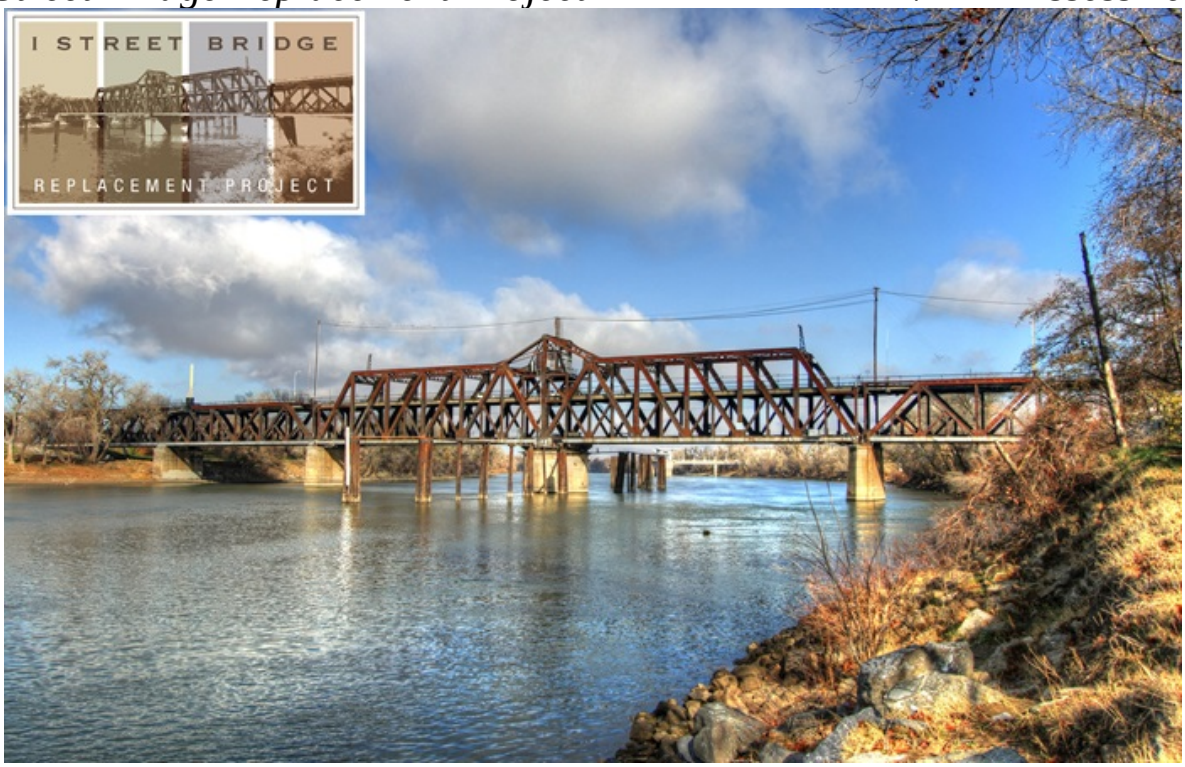
Tree Species	Estimated Diameter at Breast Height (inches)[1]
West Sacramento, Alternative 1 Area Only	
Fremont's cottonwood	48 + 36
Valley oak	36
California black walnut	48 + 24
Valley oak	40
Fremont's cottonwood	48
Fremont's cottonwood	48
Fremont's cottonwood	36
Fremont's cottonwood	36
Fremont's cottonwood	36
Fremont's cottonwood	48
Fremont's cottonwood	24
Fremont's cottonwood	36
Black locust	12 + 12
Fremont's cottonwood[2]	>24
Fremont's cottonwood[2]	>24
Fremont's cottonwood[2]	>24
Fremont's cottonwood[2]	>24
Fremont's cottonwood[2]	>24
Fremont's cottonwood[2]	>24
Fremont's cottonwood[2]	>24
Fremont's cottonwood[2]	>24
Fremont's cottonwood[2]	>24
Fremont's cottonwood[2]	>24
Fremont's cottonwood[2]	>24
Fremont's cottonwood[2]	>24
Fremont's cottonwood[2]	>24
Fremont's cottonwood[2]	>24
West Sacramento, Alternative 2 Area Only	
California black walnut	36
Coast redwood	24
Sacramento, All Impact Areas	
Black willow	12
Western sycamore	24
Western sycamore	16
Valley oak	12
Western sycamore	24
Valley oak	10 + 10
Arroyo willow	12
Fremont's cottonwood	24
Fremont's cottonwood	48
Fremont's cottonwood	18
Fremont's cottonwood	24
Fremont's cottonwood	18
California black walnut	24
Valley oak	12 + 12
Fremont's cottonwood	12 + 10
Fremont's cottonwood	36
Fremont's cottonwood	36
Fremont's cottonwood	24
California black walnut	12 + 8

Tree Species	Estimated Diameter at Breast Height (inches)[1]
Oregon ash	6 + 6
Fremont's cottonwood	24
Valley oak	12 + 10 + 8 + 8

Note: The definition of protected trees is based on the City of Sacramento and City of West Sacramento heritage tree ordinances. The appropriate definition was applied based on the tree's location. Tree species that are considered invasive species (i.e., tree of heaven and black locust) were included in the table.

[1] A "+" between numbers indicates the individual trunk diameters of a multi-trunked tree.

[2] The number and sizes of these trees were estimated based on viewing from opposite the slope on which they were growing.



Biological Assessment/ Essential Fish Habitat Assessment

I Street Bridge Replacement Project

Sacramento and Yolo Counties

Federal Project No.: BRLS 5002(164)

June 2016

Caltrans
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Biological Assessment/

Essential Fish Habitat Assessment

I Street Bridge Replacement Project

Sacramento and Yolo Counties

Federal Project No.: BRLS 5002(164)

June 2016

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Summary of Findings, Conclusions and Determinations

The City of Sacramento, in cooperation with the City of West Sacramento and the California Department of Transportation (Caltrans), proposes to construct a new bridge over the Sacramento River to replace the vehicle crossing that is currently accommodated by the existing I Street Bridge in order to remove a series of functionally obsolete or structurally deficient bridges (i.e., approach structures). The new connection also would reduce future traffic congestion, improve operations and safety, serve multiple modes of transportation, and comply with current American Association of State Highway and Transportation Officials, Caltrans, and local agency design standards. The new approximately 860-foot-long bridge, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides, would be located north of the existing I Street Bridge. The proposed bridge would be a five-span bridge, with an approximately 330-foot-long movable center span to meet U.S. Coast Guard (USCG) requirements. Both in-water and out-of-water construction activities would be required.

The purpose of this biological assessment (BA) is to provide technical information and to review the proposed project in sufficient detail to determine to what extent the proposed project may affect species that are federally threatened, endangered, or proposed for threatened or endangered status. This BA was prepared in accordance with legal requirements found in Section 7(a)(2) of the Endangered Species Act (ESA) (16 U.S. C 1536[c]) and based on Federal Highway Administration (FHWA) and Caltrans regulation, policy and guidance.

The biological study area (BSA) currently supports four federally-listed fish species, including Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run Chinook salmon (*O. tshawytscha*), Central Valley steelhead (*O. mykiss*), and Southern Distinct Population Segment (DPS) of North American green sturgeon (*Acipenser medirostris*) (all listed as threatened under the ESA, except Sacramento River winter-run Chinook salmon which is listed as endangered), provides rearing and foraging habitat for Central Valley fall-/late fall–run Chinook salmon (*O. tshawytscha*) (a species of concern), and is designated critical habitat for Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, and North American green sturgeon. The biological study area also supports essential fish habitat (EFH) for Pacific salmon (Chinook salmon) which are managed under federal fisheries management plans in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

The project proponent proposes to implement the following measures to avoid and minimize project construction effects on listed fish species, designated critical habitat, and EFH:

- Measure 1: Install Orange Construction Fencing between the Construction Area and Adjacent Sensitive Biological Resources
- Measure 2: Conduct Environmental Awareness Training for Construction Employees
- Measure 3: Conduct Periodic Biological Monitoring
- Measure 4: Conduct All In-Water Construction Activities between May 1 and November 30 and during Daylight Hours Only
- Measure 5: Implement Measures to Minimize Exceedance of Interim Threshold Sound Levels during Pile Driving
- Measure 6: Develop and Implement a Hydroacoustic Monitoring Plan
- Measure 7: Protect Water Quality and Prevent Erosion and Sedimentation in Drainages and Wetlands
- Measure 8: Monitor Turbidity in the Sacramento River
- Measure 9: Implement Cofferdam Restrictions
- Measure 10: Prepare and Implement a Fish Rescue and Relocation Plan
- Measure 11: Prevent the Spread or Introduction of Aquatic Invasive Species
- Measure 12: Minimize or Avoid Temporary Construction Lighting and Permanent Bridge Lighting from Directly Radiating on Water Surfaces of the Sacramento River

In addition, the project proponent would compensate for permanent impacts on critical habitat and loss of riparian vegetation and SRA cover by implementing the following measures:

- Measure 13: Compensate for Loss of Perennial Stream
- Measure 14: Purchase Channel Enhancement Credits for Impacts on Critical Habitat
- Measure 15: Compensate for Temporary Effects to and Permanent Loss of Cottonwood Riparian Forest (including SRA Cover)

The project is likely to adversely affect listed fish species, designated critical habitat, and EFH. The primary effect of the project would be the exposure of some fish to harmful noise levels during impact pile driving potentially resulting in harassment, injury or death of individuals. The probability of injury or death is difficult to predict and would be based on the timing and frequency of pile driving; the extent that vibratory drivers and attenuation devices would minimize the duration and intensity of impact pile driving; and the numbers, size, and mobility of listed species that may occur in the vicinity of the construction area while impact pile driving is occurring. Even with implementation of the proposed avoidance and minimization measures, construction activities may cause fish to delay their migration or cease foraging in response to increased turbidity, suspended sediment, and underwater noise; however, any behavioral effects

would be temporary and are not expected to measurably affect growth, survival, or reproductive success.

The proposed project would also result in a permanent loss of 1.44 acre of cottonwood riparian forest habitat, supporting 0.44 acre and 890 linear feet of SRA cover habitat; aquatic habitat (substrate and water column) for all fish species equal to the permanent loss of 10,449 square feet (0.24 acre) of substrate area; and a net permanent loss of 32,650 cubic feet of water column (aquatic) habitat from construction of the new in-water bridge piers and pilings for the new bridge fender system. In addition, construction of the new bridge will result in the creation of approximately 55,000 square feet (1.26 acre) of permanent over-water structure (shade) on the Sacramento River from the deck of the new bridge.

Long-term effects on the primary constituent elements (PCEs) or conservation value of critical habitat in the study area for all four species would include temporary effects on the water column (underwater noise and sound pressure, and water quality impacts) and channel substrate (cofferdams and trestles), and permanent loss of aquatic habitat (water column and substrate) from new bridge piers, RSP, and pilings for the new bridge fender system, and permanent loss of riparian forest and SRA cover habitat in the Sacramento River. Adverse effects on EFH would be similar to those listed above for critical habitat and would temporarily and permanently reduce the availability of EFH for Pacific salmon.

Summary of Determinations

The project *is likely to adversely affect* Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, and North American green sturgeon. The primary effect of the project would be the exposure of some fish to harmful noise levels during impact pile driving potentially resulting in harassment, injury or death of individuals. Even with implementation of the proposed avoidance and minimization measures, construction activities may cause fish to delay their migration or cease foraging in response to increased turbidity, suspended sediment, and underwater noise; however, any behavioral effects would be temporary and are not expected to measurably affect growth, survival, or reproductive success.

The project *is likely to adversely affect* critical habitat for Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, and North American green sturgeon. Project effects on critical habitat include temporary effects on the water column (underwater noise and sound pressure, and water quality impacts) and channel substrate (cofferdams and trestles), and permanent loss of aquatic habitat (water column and substrate) from new bridge piers, RSP, and pilings for the new bridge fender system, and permanent loss of riparian forest and SRA cover habitat in the Sacramento River. Compensation

is proposed for the permanent loss of critical habitat and cottonwood riparian forest, including SRA cover habitat.

The project *is likely to adversely affect* EFH for Pacific salmon. Adverse effects on EFH would be similar to those listed above for critical habitat and would temporarily and permanently reduce the availability of EFH.

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List of Abbreviated Terms

°C	degrees Celsius
°F	degrees Fahrenheit
ADA	Americans with Disabilities Act
AIS	aquatic invasive species
BA	biological assessment
BMPs	best management practices
BO	biological opinion
BSA	biological study area
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CCV	California Central Valley
Central Valley Subprovince	Sacramento-San Joaquin Province
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CIDH	cast-in-drill-hole
CISS	cast-in-steel-shell
CVFPB	Central Valley Flood Protection Board
CVP	Central Valley Project
dB	decibel
dB RMS	decibels root mean square
DCC	Delta Cross Channel
Delta	Sacramento–San Joaquin River Delta
DJFMP	Delta Juvenile Fish Monitoring Program
DPS	Distinct Population Segment
EFH	essential fish habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FHWA	Federal Highway Administration
FHWG	Fisheries Hydroacoustic Working Group
FR	Federal Register
FRFH	Feather River Fish Hatchery
HBP	Highway Bridge Program
HUC	hydrologic unit code
I-5	Interstate 5
ICF	ICF International

LSNFH	Livingston Stone National Fish Hatchery
mm	millimeters
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MTP	Metropolitan Transportation Plan
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NTUs	nephelometric turbidity units
OHWM	ordinary high water mark
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCEs	primary constituent elements
RBDD	Red Bluff Diversion Dam
RM	river mile
RSP	rock slope protection
SACOG	Sacramento Area Council of Governments
SCS	Sustainable Communities Strategy
SEL	sound exposure level
SPL	sound pressure level
SRA	shaded riverine aquatic
SWP	State Water Project
TNW	traditional navigable water
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USCG	U.S. Coast Guard

Chapter 1 Introduction

The purpose of this biological assessment (BA) and Essential Fish Habitat (EFH) assessment is to evaluate the effects of the proposed I Street Bridge Replacement Project on federally-listed threatened, endangered, and proposed fish species, and commercial fish species, respectively. This BA is prepared in accordance with legal requirements found in Section 7(a)(2) of the Endangered Species Act (ESA) (16 U.S.C 1536[c]) and based on Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans) regulation, policy, and guidance. Section 305(b)(2)-(4) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires Caltrans and the U.S. Army Corps of Engineers (USACE) to consult with the National Marine Fisheries Service (NMFS) on any action authorized, funded, or undertaken that may adversely impact EFH. The EFH assessment is integrated into this BA and the EFH consultation process will be integrated into the NMFS biological opinion (BO) for the project. NMFS will provide EFH conservation recommendations for actions that would adversely affect EFH.

The project is subject to state and federal environmental review requirements because of use of federal Highway Bridge Program (HBP) funds from the FHWA. Accordingly, project documentation is being prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The City of Sacramento is the lead agency under CEQA, with the City of West Sacramento as a responsible agency, and Caltrans is the lead agency under NEPA. NEPA approval is expected to be achieved with an Environmental Assessment. CEQA approval will be achieved with an Environmental Impact Report.

The FHWA's other responsibilities for environmental review, consultation, and any other action required in accordance with applicable federal laws for this project will be carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S. Code (USC) 327.

1.1 Project History and Background

The City of Sacramento, in cooperation with the City of West Sacramento and the California Caltrans, proposes to construct a new bridge over the Sacramento River (approximately river mile [RM] 59.5) between the cities of Sacramento and West Sacramento, approximately 1,000 feet north of the existing I Street Bridge (Figure 1-1). The project limits starting within the City of Sacramento consist of Railyards Boulevard from 200 feet east of Bercut Drive on the east, continuing west over the Sacramento River into the City of West Sacramento along C Street, and terminating approximately 100 feet west of the 5th Street intersection (Figure 1-2). The project

limits also extend along Bercut Drive approximately 500 feet north of Railyards Boulevard, along Jibboom Street 550 feet north of Railyards Boulevard and 300 feet south of Railyards Boulevard, along 3rd Street 50 feet north and south of C Street, along 4th Street 50 feet north and south of C Street, along 5th Street 50 feet north and south of C Street, and includes the existing roadway approach structures leading to both sides of the existing I Street Bridge. The total length of the project is approximately 0.42 mile along C Street and Railyards Boulevard. This project is included in the Sacramento Area Council of Governments (SACOG) 2035 *Metropolitan Transportation Plan/Sustainable Communities Strategy* (MTP/SCS).

Constructed in 1911, the existing I Street Bridge is a historic double-deck, steel truss swing bridge. The lower level of the bridge provides rail access across the Sacramento River, while the upper level provides highway and pedestrian access. In 2011, the cities of Sacramento and West Sacramento completed the Sacramento River Crossings Alternatives Study which identified the purpose and need for new bridge crossings. The study concluded that a North Market Area (the area north of I Street) crossing was needed to replace the existing I Street Bridge, which has lanes that are too narrow to serve buses, lacks bicycle lanes, and has sidewalks that are too narrow to meet accessibility standards.

1.1.1 Purpose and Need

The purpose of the project is to construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge from C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento in order to remove a series of functionally obsolete or structurally deficient bridges, consistent with the adopted findings of the Sacramento River Crossings Alternatives Study for Bridge Location 2 in the North Market Area.

The purpose and objectives of the project are listed below.

- The project should construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge from C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento, consistent with the adopted findings of the Sacramento River Crossings Alternatives Study for Bridge Location 2 in the North Market Area.
- The new bridge should meet the requirements of the Neighborhood Friendly Bridge definition that the City of Sacramento City Council adopted by resolution on October 18, 2011, which is defined by the following elements.
  - A facility whose primary function is local connectivity rather than regional travel and primarily serves short local trips.

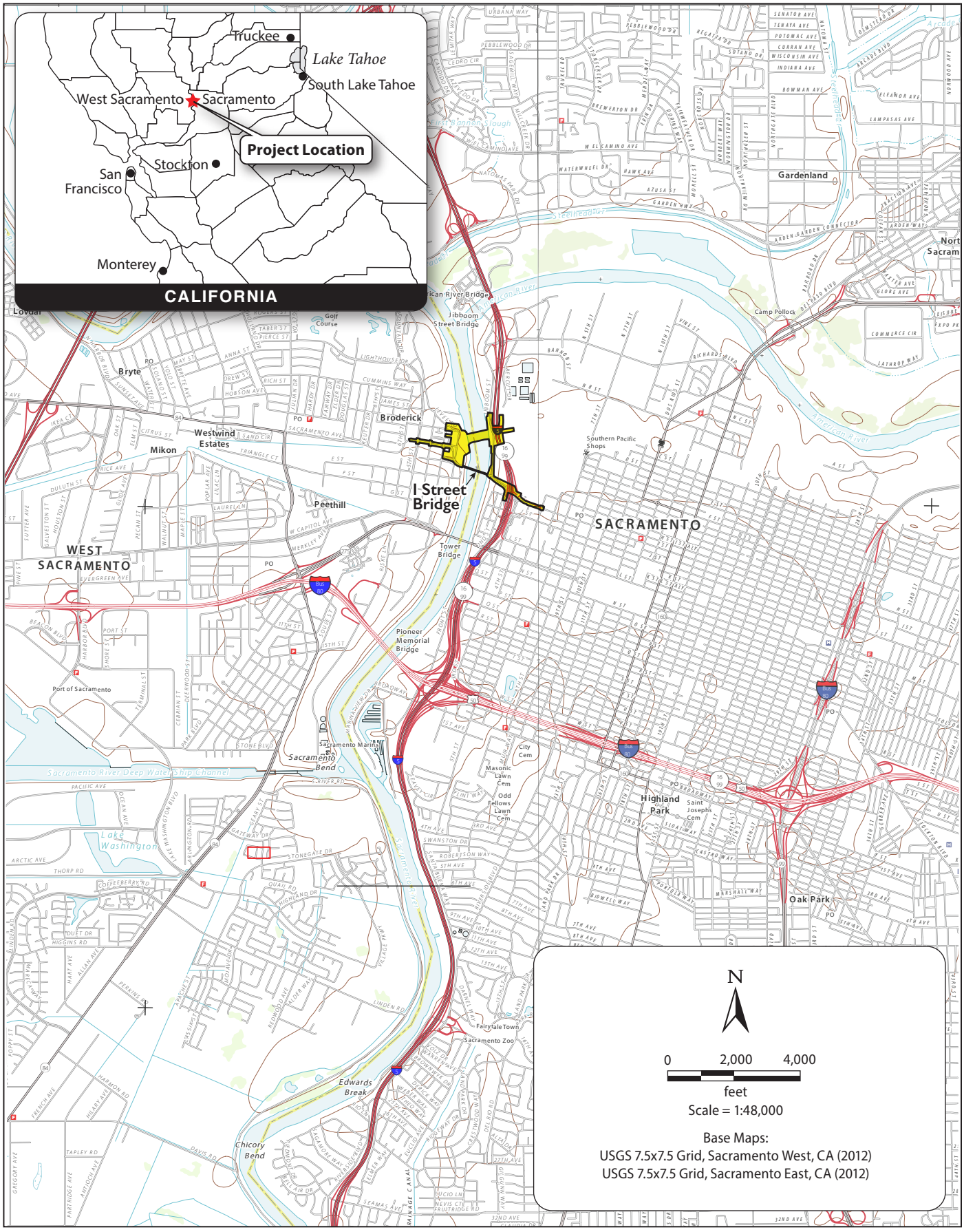

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Figure 1-1
Vicinity Map

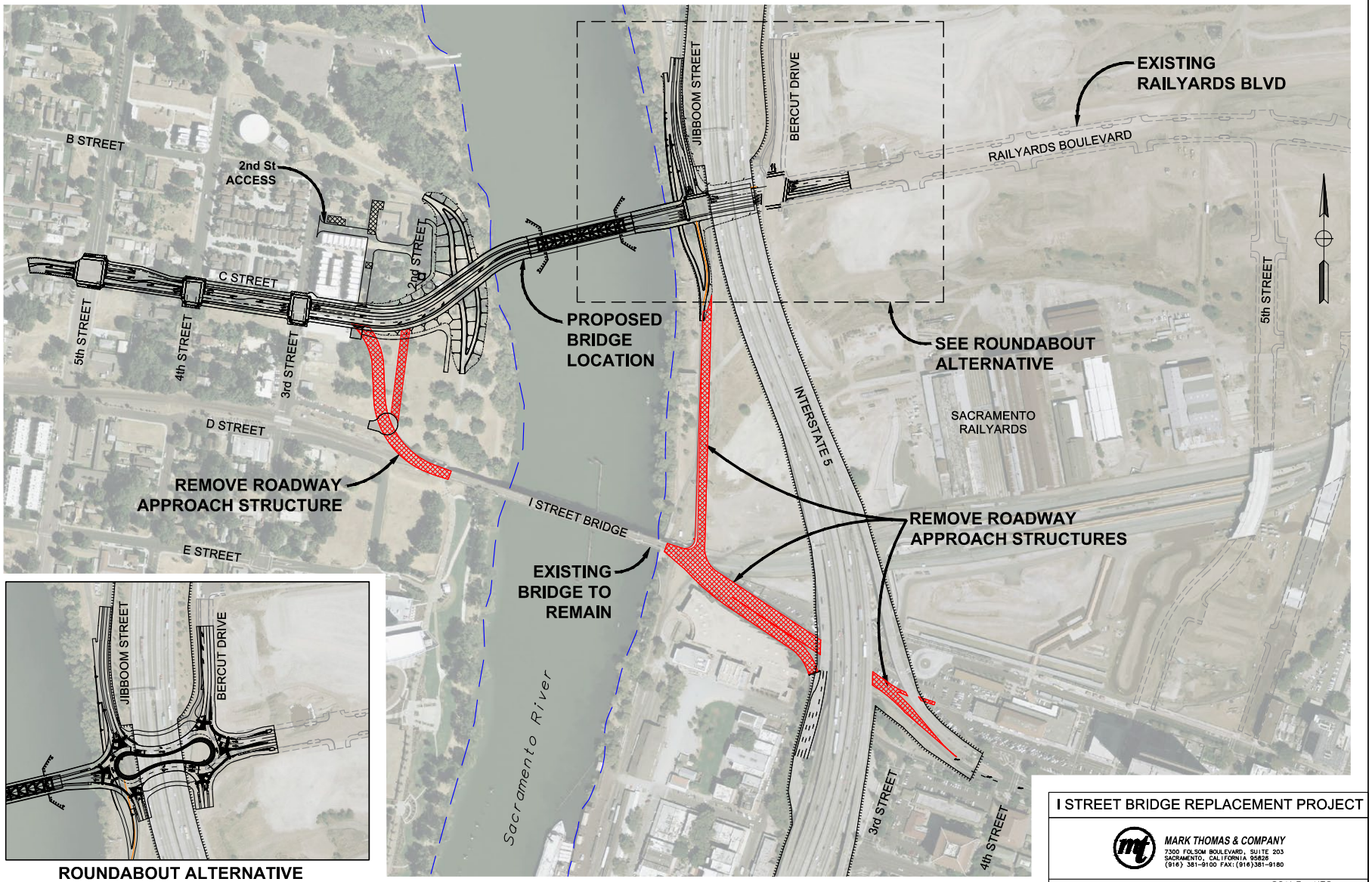

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Figure 1-2
Proposed Project

  - A bridge which serves all users, including motorists, bicyclists, pedestrians, low energy vehicles, and public transit riders.
  - A bridge with aesthetics and dimensions which are architecturally pleasing and contextually appropriate for the adjacent neighborhoods.
  - A bridge that does not exceed or expand the already-planned capacity of the approach roadways (i.e., no widening of approaches just to accommodate bridge flows).
  - A facility which is designed with a target speed equal to or less than the approach roadways.
  - A bridge which reduces the growth in vehicle miles traveled in the adjacent communities.
  - A bridge that does not connect directly to streets which are primarily residential in character.
  - A bridge that is consistent with the Need and Purpose statement [the adopted Sacramento River Crossings Alternatives Study statement] as articulated.
- In addition to the Neighborhood Friendly Bridge definition, the project should include pedestrian and bicycle facilities in the new public crossing that meet Americans with Disabilities Act (ADA) requirements, and facilitate connections to and from the new crossing and the Sacramento River Parkway and Riverfront Park trails.
- The proposed project also would need to construct a movable bridge that satisfies the vertical clearance and river navigation requirements of the U.S. Coast Guard (USCG).
- The project design should not preclude future addition of a streetcar, a separate, stand-alone project being developed by the Cities of West Sacramento and Sacramento.
- The new bridge also is intended to improve the connectivity to, and accessibility of, businesses, recreational areas, and new or redevelopment opportunity sites located in the urban core of Sacramento and West Sacramento.

The project is needed for the following reasons.

- The existing I Street Bridge does not fully comply with current design and traffic operation standards due to the following conditions.
  - I Street Bridge limits or restricts traffic capacity and multimodal use. The current bridge width is not sufficient to provide adequate traffic operations, bicycle lanes, or the ability for transit service across the bridge.
  - The I Street Bridge and the four associated approach structures are on the federal eligible bridge list for federal funds for replacement and/or rehabilitation through the HBP. The I Street Bridge has been classified as functionally obsolete, and the existing approach structures have been classified as structurally deficient. The Cities of Sacramento and West Sacramento have decided to pursue replacement through the HBP.

- As adopted by the Sacramento City Council, new crossings of the Sacramento River between the City of Sacramento and City of West Sacramento shall be Neighborhood Friendly. In coordination with staff from the City of West Sacramento and SACOG, the definition for a Neighborhood Friendly Bridge was developed by the City of Sacramento and the Sacramento City Council adopted the definition by resolution in October 2011. The replacement bridge structure is required to be consistent with the Neighborhood Friendly Bridge definition.
- In addition to the Neighborhood Friendly Bridge requirements, lack of ADA compliance, non-standard and non-continuous sidewalks, and lack of bicycle facilities discourage walking and bicycling on the existing I Street Bridge.
- Section 9 of the Rivers and Harbors Act requires any local, state, or federal agency planning to construct a bridge over a navigable waterway to apply for a bridge permit through the USCG. The USCG requires the new bridge to meet or exceed the existing vertical clearance along the river, which is currently set by the US 50 Pioneer Bridge. In order to comply with the Neighborhood Friendly Bridge definition and meet the USCG requirements for navigation clearance, the new bridge would need to be movable.
- The SACOG MTP/SCS identifies that a proposed streetcar would cross over the new bridge from Sacramento to West Sacramento. While the streetcar would be a separate, stand-alone project, the bridge design must not preclude the future addition of a streetcar.
- Limited connectivity to the riverfront reduces the potential to achieve planned urban development and redevelopment of opportunity sites identified in the adopted plans of Sacramento and West Sacramento.

1.2 Project Description

1.2.1 Proposed Project

A new 860-foot-long bridge is proposed to be constructed to the north of the existing I Street Bridge (Figure 1-2). The proposed bridge alignment would connect Railyards Boulevard in the City of Sacramento with C Street in the City of West Sacramento. This alignment also allows the existing I Street Bridge to remain in operation during construction of the new bridge. Once construction of the new bridge is complete, the roadway approach structures leading up to the existing I Street Bridge from both directions would be demolished; however, the existing I Street Bridge would continue to be used by the railroad.

Roadway improvements on Railyards Boulevard in Sacramento and C Street in West Sacramento also are proposed. In the City of Sacramento, the intersection at Jibboom Street and Bercut Drive would be controlled by a signal or consist of a roundabout. In the City of West Sacramento, the

proposed C Street alignment would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. To maintain access to these parcels, a new connection to C Street would be constructed approximately 150 feet east of the C Street/3rd Street intersection, and would continue north approximately 300 feet, then make a 90-degree turn, and connect to 3rd Street approximately 300 feet north of C Street.

New Bridge Construction and Roadway Modifications

Bridge Construction

The proposed project would construct a new bridge over the Sacramento River. The total bridge length would be approximately 860 feet long, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides of the bridge. The bridge would include two fixed-span approach structures that tie into the Sacramento and West Sacramento banks of the river and are approximately 200 feet and 270 feet in length, respectively (see Figure 1-3). The center span of the bridge would be a movable span that meets the USCG requirements. The movable span is anticipated to be approximately 330 feet in length. The bridge soffit elevation would be set 3 feet above the 200-year water surface elevation to comply with the Central Valley Flood Protection Board (CVFPB) freeboard requirements.

The two fixed-span approach structures would be 72 feet wide, with a superstructure depth (or total bridge thickness) of approximately 6 feet. Each approach structure would be a two-span bridge. The abutment at one end of the structure would be constructed on the banks of the river, a center pier would be placed within the river approximately around the existing bank toe of slope, and the other end of the approach structure would be constructed on the piers for the movable span.

Based on coordination with the USCG, the movable span would provide a 278-foot clear channel opening approximately centered at the middle of the river. As such, the movable span has been identified as a vertical lift bridge, which would raise the bridge to a minimum vertical clearance of 59 feet over the maximum river elevation of 31 feet (measured to the NGVD 29 vertical datum). The truss depth of the movable span would be approximately 40 feet, with 6 feet of the structure being below the bridge deck and 34 feet above the bridge deck. The vertical towers would be approximately 130 feet tall, measured from the bridge soffit elevation. The vertical towers would be approximately 33 feet in thickness and the same width as the bridge deck. The total bridge width on the movable span would be 81 feet.

Due to the existing soil conditions, the bridge would be constructed on deep pile foundations. Table 1-1 summarizes the type and size of piles that would be used during construction of the new bridge, and the depth to which the piles would be installed. The abutments for the fixed-

span approach structures at the river bank would consist of approximately 50 piles per abutment that are driven or cast-in-drill-hole (CIDH), to a depth of approximately 70 feet below the original ground elevation. The center piers for the two fixed-span approach structures (located approximately at the bank toe of slope in the river, below the ordinary high water mark) would consist of 50 driven or CIDH piles per pier that are approximately 70 feet below the original ground elevation. If driven piles are selected for either the abutments or piers, the piles would be precast concrete or steel. The foundations for the movable span would consist of four large-diameter cast-in-steel-shell piles per pier. Each pile would be 9 feet in diameter, extending approximately 140 feet below the original ground elevation, and would be driven with a vibratory hammer and/or with a hydraulic oscillator/rotator system.

Table 1-1. Piles Proposed to Construct I Street Bridge

Pile Location	Pile Diameter/ Type	Total Number of Piles to be Installed	Depth of Installation (feet)	Temporary or Permanent Installation
Abutments 1 and 6	16-in diameter steel	100	70	Permanent
	16-in square precast concrete (alternative to 16-in diameter steel above)			
Piers 2 and 5	16-in diameter steel	100	70	Permanent
	16-in square precast concrete (alternative to 16-in diameter steel above)			
Piers 3 and 4	108-in steel casings	8	140	Permanent
Bridge Fender System	16-in diameter concrete	60	30	Permanent
Temporary trestle	16-in diameter steel	160	70	Temporary
	16-in H pile (alternative to 16-in diameter steel pile above)			
Spud piles	16-in diameter steel	8	40	Temporary
Cofferdams	Sheet piles	180	25	Temporary

Erosion control measures would be installed around the proposed bridge foundations to prevent future scour at the bridge supports. It is anticipated that rock slope protection (RSP) would be installed around the bridge abutments and piers within the water to control erosion.

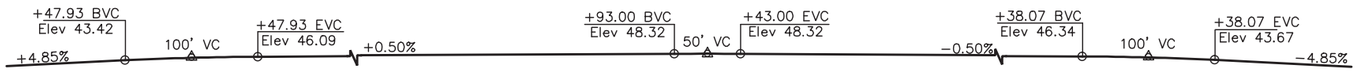
A bridge fender system also is planned around the movable span piers to protect the piers from errant watercrafts that are navigating along the river. The fender system would include approximately 30 driven concrete or wooden piles around each of the movable span piers (Table 1-1). The piles would be driven to a depth of approximately 30 feet below the original ground elevation.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
03	YOL/SAC	"C"/"RY"	N/A

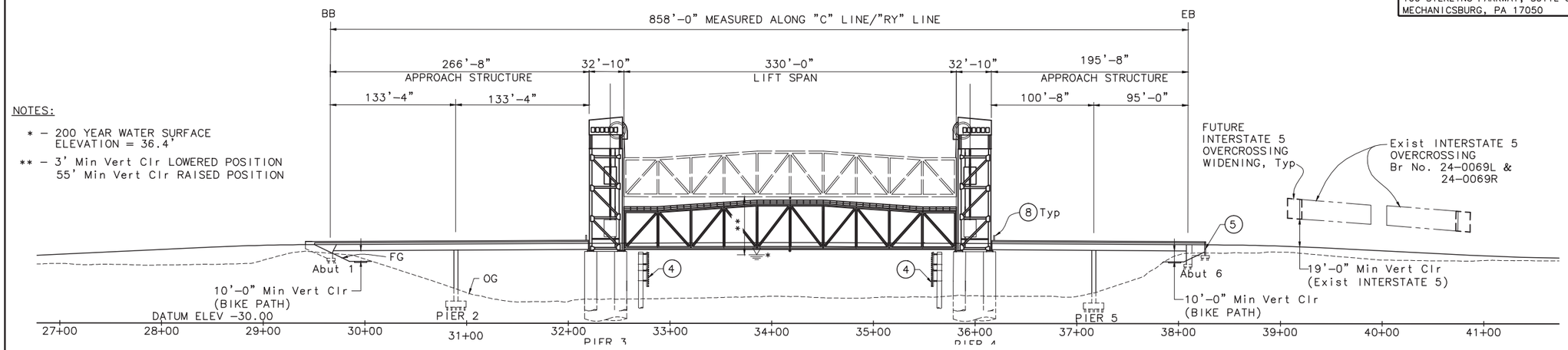
CITY OF SACRAMENTO
DEPARTMENT OF PUBLIC WORKS
915 I STREET, ROOM 2000
SACRAMENTO, CA 95814

MARK THOMAS & COMPANY, INC.
7300 FOLSOM BLVD., SUITE 203
SACRAMENTO, CA 95826

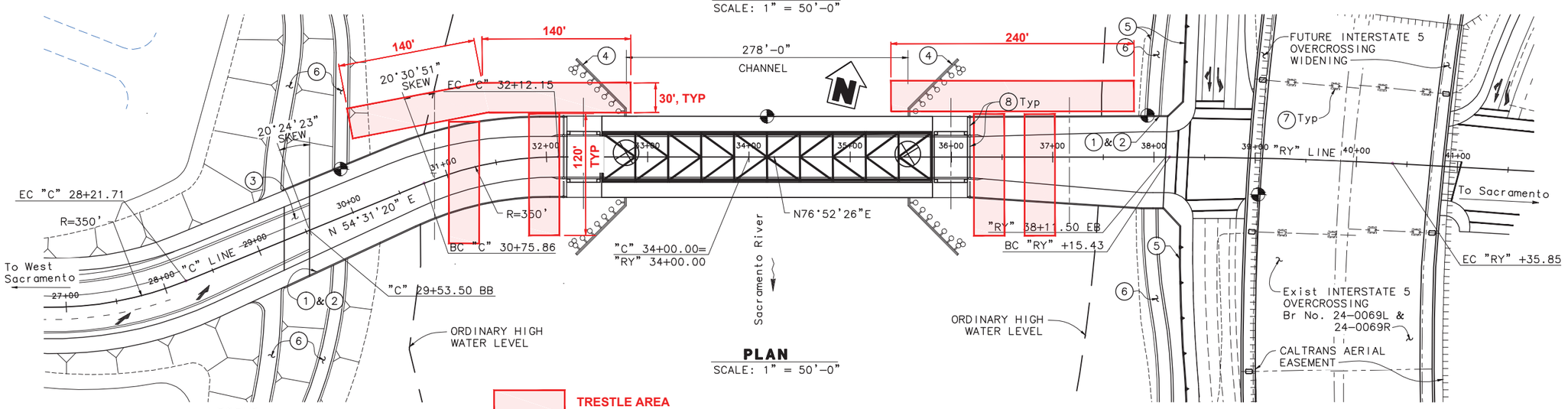
MODJESKI AND MASTERS, INC.
100 STERLING PARKWAY, SUITE 302
MECHANICSBURG, PA 17050



PROFILE GRADE
NO SCALE



ELEVATION
SCALE: 1" = 50'−0"



PLAN
SCALE: 1" = 50'−0"

TRESTLE AREA

LEGEND:

- POINT OF MINIMUM VERTICAL CLEARANCE
- USCG GPS TARGET LOCATION
- (1) PAINT BRIDGE NAME
- (2) PAINT BRIDGE NUMBER
- (3) APPROACH SLAB
- (4) FENDER SYSTEM
- (5) RETAINING WALL
- (6) BIKE PATH
- (7) ISOLATION CASING AROUND EXISTING BRIDGE COLUMNS
- (8) TRAFFIC/PEDESTRIAN GATE & WARNING SIGNAL

X
DESIGN OVERSIGHT
X
SIGN OFF DATE

DESIGNED BY	J. HICKEY	DATE	03−20−15
DRAWN BY	J. DOTY	DATE	03−20−15
CHECKED BY	T. PHAM	DATE	03−20−15
APPROVED	E. FREDRICKSON	DATE	03−20−15

E. FREDRICKSON
PROJECT ENGINEER

ALTERNATIVE 1
PLANNING STUDY
I STREET BRIDGE (REPLACE)

BRIDGE NO. XXX	UNIT:
SCALE: AS SHOWN	PROJECT NUMBER & PHASE: 03−XXXXXX

CONTRACT NO.: X
PROJECT ID: 00000000000

ADVANCE PLANNING STUDY SHEET (ENGLISH) (REV. 7/16/10)
FILE => I STREET TRESTLE EXHIBIT.DWG
DATE PLOTTED => 10−Jul−15 TIME PLOTTED => 10:41 AM
USERNAME => JDOTY
Graphics... 00203.14 (7/13/15) AB

Figure 1-3
Proposed I Street Bridge: Plan View, Profile, and Elevation

Temporary Falsework and Cofferdams

Temporary falsework platforms (trestles) would be required to construct the proposed bridge foundations and approach structures. The platforms would be constructed during the first construction season using temporary piles within the river. Each temporary platform would include approximately 80 driven steel piles; the piles would be either 16-inch diameter or 16-inch H piles (Table 1-1). Once installed, the temporary trestle piles would remain in the river throughout the duration of construction and would be removed in the second construction season following completion of construction. In addition, temporary cofferdams would be required to construct piers 2 and 5 for the new bridge, which would be within the water. The cofferdams would consist of temporary sheet piles installed around the individual piers. The sheet piles would be installed and removed with a vibratory hammer. Dewatering inside the cofferdams would be required.

Bridge Construction Sequence

Figure 1-4 shows the sequencing of construction activities. All in-water work would be conducted between May 1 and November 30 during the two construction seasons. This schedule is intended to reduce the number of construction seasons to construct the bridge, while minimizing or avoiding construction effects on sensitive fish and wildlife species.

Roadway Modifications

City of Sacramento

In Sacramento, Railyards Boulevard would be extended west over the Sacramento River. East of Bercut Drive, Railyards Boulevard would consist of two westbound lanes and one eastbound lane. Between Jibboom Street and Bercut Drive, Railyards Boulevard would consist of two westbound lanes and three eastbound lanes with a signalized intersection at Jibboom Street and Bercut Drive, or consist of a roundabout with two lanes in each direction. West of the Jibboom Street intersection, Railyards Boulevard would consist of one lane in each direction.

Bercut Drive would be modified from Railyards Boulevard north approximately 500 feet. Bercut Drive would be designed to have two northbound lanes at the Railyards Boulevard intersection, tapering down to one northbound lane at the northern project limits, and one southbound lane. Improvements to Bercut Drive south of Railyards Boulevard are not part of, nor needed for, the proposed project and would be constructed if needed as part of a separate future project.

Proposed improvements on Jibboom Street would extend 550 feet north of Railyards Boulevard. The roadway would consist of one travel lane in each direction, on-street Class II bike lanes, sidewalk along the west side of the roadway, and retaining walls of various heights along both sides of the road. Extension of Jibboom Street south of Railyards Boulevard is not included with,

nor needed for, the proposed project and would be constructed if needed as part of a separate future project.

The proposed roadway profile for Railyards Boulevard would be approximately 6 feet higher than the original ground elevation at the Jibboom Street intersection. The profile adjustment is needed in order to satisfy the CVFPB requirements to provide 3 feet of clearance between the 200-year-flood water surface elevation and the bridge soffit (or low chord of the bridge).

City of West Sacramento

The new C Street alignment would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. The new alignment would connect to C Street approximately 150 feet east of the 3rd Street intersection and continue north approximately 300 feet. This new alignment would then make a 90-degree left turn and connect to 3rd Street approximately 300 feet north of C Street. This new alignment would require right-of-way acquisition from seven individual parcels and removal of three structures. One structure is located on APN 010-101-010 and appears to be an individual residence. Another structure is located on APN 010-101-013 and appears to be an apartment building that supports up to one individual apartment. The last structure is located on APN 010-101-004 and appears to be an individual residence.

Between the bridge touchdown location along C Street in West Sacramento and the 4th Street/ C Street intersection, the roadway would consist of one westbound travel lane, two eastbound travel lanes (the two eastbound travel lanes would taper down to one eastbound lane east of the 3rd Street intersection), a center left-turn lane, on-street Class II bike lanes, on-street parking along the north side of the roadway, and sidewalks along both sides of the roadway. As the roadway through this section currently consists of the proposed number of travel lanes, the widening through this area is primarily needed to support the Class II bike lanes and wider sidewalks.

Along C Street between 4th Street and 5th Street, the roadway would consist of one travel lane in each direction, left-turn lanes, on-street Class II bike lanes, and sidewalks along both sides of the road. All of the improvements through this section would be accommodated within the existing roadway limits.

Class I Bikeway and Levee Modifications and Improvements

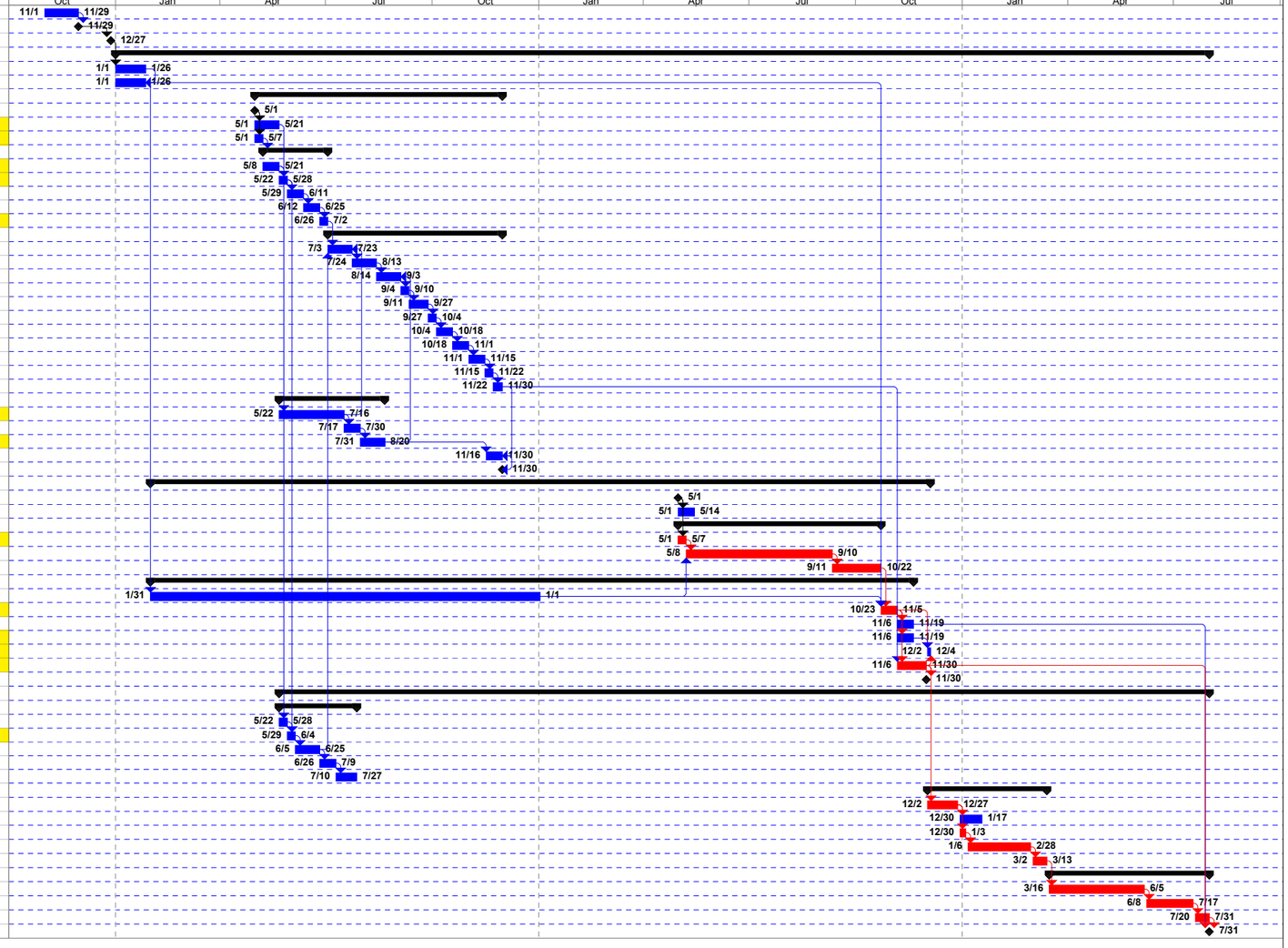
City of Sacramento

The existing Class I Sacramento River Parkway along Jibboom Street would be reconstructed approximately 500 feet north and 300 feet south of Railyards Boulevard as part of the proposed project. In order to maintain a continuous off-street Class I path along this section, the path

I Street Bridge Replacement Construction Schedule

7-Day Work Week

ID	Task Name	Duration	Start	Finish	Predecessors	Successors
1	Advertise	21 days	Wed 11/1/17	Wed 11/29/17		2
2	**Bid Opening**	**0 days**	**Wed 11/29/17**	**Wed 11/29/17**	**1**	**3FS+4 wks**
3	**Award**	**0 days**	**Wed 12/27/17**	**Wed 12/27/17**	**2FS+4 wks**	**5**
4	**Working Days**	**675 days**	**Mon 1/1/18**	**Fri 7/31/20**		
5	Submittals/Shop Drawings	4 wks	Mon 1/1/18	Fri 1/26/18	3	6FF
6	Mobilize	4 wks	Mon 1/1/18	Fri 1/26/18	5FF	43,44
7	**In Water Work Season 1**	**153.5 days**	**Tue 5/1/18**	**Fri 11/30/18**		
8	**In Water Work Begins**	**0 days**	**Tue 5/1/18**	**Tue 5/1/18**		**9,10**
9	Install Temp Constr Trestle From Bank to Piers	3 wks	Tue 5/1/18	Mon 5/21/18	8	30
10	Setup Barge	1 wk	Tue 5/1/18	Mon 5/7/18	8	11
11	**Pier 2&5 Work**	**40 days**	**Tue 5/8/18**	**Mon 7/2/18**	**10**	
12	Cofferdam and Dewatering	2 wks	Tue 5/8/18	Mon 5/21/18		13,52
13	Pier 2&5 Pile Driving	1 wk	Tue 5/22/18	Mon 5/28/18	12	14,53
14	Form/Pour Pier 2&5 Pile Cap	2 wks	Tue 5/29/18	Mon 6/11/18	13	15
15	Pier 2 & 5 Column Construction	2 wks	Tue 6/12/18	Mon 6/25/18	14	16
16	Remove Cofferdam & Place Rock Slope Protection	1 wk	Tue 6/26/18	Mon 7/2/18	15	18
17	**Approach Superstructure**	**108.5 days**	**Tue 7/3/18**	**Fri 11/30/18**		
18	Erect Falsework & Soffit	3 wks	Tue 7/3/18	Mon 7/23/18	30FF,54,16	19
19	Form Exteriors, Overhangs	3 wks	Tue 7/24/18	Mon 8/13/18	18	20
20	Rebar and Soffit Stems	3 wks	Tue 8/14/18	Mon 9/3/18	19,32FF	21
21	Install PT Ducts	1 wk	Tue 9/4/18	Mon 9/10/18	20	22
22	Form, Pour Soffit & Stems	2.5 wks	Tue 9/11/18	Thu 9/27/18	21	23
23	Strip Stems & Lost Deck	1 wk	Thu 9/27/18	Thu 10/4/18	22	24
24	Place Lost Deck	2 wks	Thu 10/4/18	Thu 10/18/18	23	25
25	Deck Rebar & Pour	2 wks	Thu 10/18/18	Thu 11/1/18	24	26
26	Deck Cure	2 wks	Thu 11/1/18	Thu 11/15/18	25	27
27	Stress & Grout Bridge	1 wk	Thu 11/15/18	Thu 11/22/18	26	28
28	Remove Falsework	6 days	Thu 11/22/18	Fri 11/30/18	27	48,33FF
29	**Pier 3&4 Work**	**65 days**	**Tue 5/22/18**	**Mon 8/20/18**		
30	Vibrate/Drive 108-in Casings	8 wks	Tue 5/22/18	Mon 7/16/18	9	31,18FF
31	Set Cage & Cast 108-in Piles	2 wks	Tue 7/17/18	Mon 7/30/18	30	32
32	Form/Pour Cap for Shafts & Place Rock Slope Protect	3 wks	Tue 7/31/18	Mon 8/20/18	31	20FF,33
33	Remove Portion of Trestle (Leave Piles in Place)	2 wks	Fri 11/16/18	Fri 11/30/18	32,28FF	34FF
34	**In Water Work Ends Season 1**	**0 days**	**Fri 11/30/18**	**Fri 11/30/18**	**33FF**	
35	**In Water Work Season 2**	**480.5 days**	**Wed 1/31/18**	**Wed 12/4/19**		
36	**In Water Work Begins**	**0 days**	**Wed 5/1/19**	**Wed 5/1/19**		**37,39**
37	Install Temp Constr Trestle (except piling)	2 wks	Wed 5/1/19	Tue 5/14/19	36	
38	**Pier 3&4 Work**	**125 days**	**Wed 5/1/19**	**Tue 10/22/19**		
39	**Setup Barge**	**1 wk**	**Wed 5/1/19**	**Tue 5/7/19**	**36**	**40**
40	**Erect Vertical Lift Towers**	**18 wks**	**Wed 5/8/19**	**Tue 9/10/19**	**39,43**	**41**
41	**Install and Test Bridge Operating Equipment**	**6 wks**	**Wed 9/11/19**	**Tue 10/22/19**	**40**	**44**
42	**Lift Span**	**470 days**	**Wed 1/31/18**	**Tue 11/19/19**		
43	Construct Vertical Lift Span (Offsite)	8.57 mons	Wed 1/31/18	Tue 1/1/19	6	40,44
44	**Float in Lift Span & Erect**	**2 wks**	**Wed 10/23/19**	**Tue 11/5/19**	**6,41,43**	**45,47,48,46**
45	Make Lift Span Operational	2 wks	Wed 11/6/19	Tue 11/19/19	44	67
46	Install Fender System & Piles	2 wks	Wed 11/6/19	Tue 11/19/19	44	47
47	Remove Barge	0.5 wks	Mon 12/2/19	Wed 12/4/19	44,46,48	
48	**Remove Trestle & Piles**	**18 days**	**Wed 11/6/19**	**Sat 11/30/19**	**28,44**	**67,58,49,47**
49	**In Water Work Ends Season 2**	**0 days**	**Sat 11/30/19**	**Sat 11/30/19**	**48**	
50	**Out of Water Work**	**574 days**	**Tue 5/22/18**	**Fri 7/31/20**		
51	**Construct Abut 1/6**	**49 days**	**Tue 5/22/18**	**Fri 7/27/18**		
52	Excavate Abutment	1 wk	Tue 5/22/18	Mon 5/28/18	12	53
53	Drive Abut Piles	1 wk	Tue 5/29/18	Mon 6/4/18	52,13	54
54	Pour Abut	3 wks	Tue 6/5/18	Mon 6/25/18	53	55,18
55	Backfill Abutment	10 days	Tue 6/26/18	Mon 7/9/18	54	56
56	Approach Slabs	14 days	Tue 7/10/18	Fri 7/27/18	55	
57	**Approach Superstructure**	**75 days**	**Mon 12/2/19**	**Fri 3/13/20**		
58	**Barriers, Median**	**4 wks**	**Mon 12/2/19**	**Fri 12/27/19**	**48**	**59,60**
59	Lighting	3 wks	Mon 12/30/19	Fri 1/17/20	58	
60	**Joint Seals**	**1 wk**	**Mon 12/30/19**	**Fri 1/3/20**	**58**	**61**
61	**Finalize Roadway Conforms**	**8 wks**	**Mon 1/6/20**	**Fri 2/28/20**	**60**	**62**
62	**Punch List**	**2 wks**	**Mon 3/2/20**	**Fri 3/13/20**	**61**	**64**
63	**Demo Existing Approach Structures**	**100 days**	**Mon 3/16/20**	**Fri 7/31/20**		
64	**Demo Existing Approach Structures**	**12 wks**	**Mon 3/16/20**	**Fri 6/5/20**	**62**	**65**
65	**Cleanup**	**6 wks**	**Mon 6/8/20**	**Fri 7/17/20**	**64**	**66**
66	**Punch List**	**2 wks**	**Mon 7/20/20**	**Fri 7/31/20**	**65**	**67**
67	**Project Completion**	**0 days**	**Fri 7/31/20**	**Fri 7/31/20**	**48,45,66**	



Project: I Street Bridge Replacement Construction Schedul
Date: Wed 2/10/16

Task	Rolled Up Task	Split	Inactive Task	Duration-only	Finish-only		
Critical Task	Rolled Up Critical Task	External Tasks	Inactive Milestone	Manual Summary Rollup	Progress		
Milestone	Rolled Up Milestone	Project Summary	Inactive Summary	Manual Summary	Deadline		
Summary	Rolled Up Progress	Group By Summary	Manual Task	Start-only	Construction Activities with In-Water Effects		

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Figure 1-4
Construction Schedule

would be grade-separated under the proposed bridge structure. Cyclists and pedestrians approaching Railyards Boulevard in either direction would have the option to continue along the path under the new structure, avoiding the need to cross the roadway. Cyclists and pedestrians who are traveling along the path also would have the option to connect to Railyards Boulevard and cross over the proposed bridge into West Sacramento or turn east into Sacramento. Due to the limited horizontal clearance between the river and the Interstate 5 (I-5) viaduct structure, retaining walls would be needed along the path to account for the vertical elevation difference between Jibboom Street and the path that continues under the proposed bridge structure. The maximum retaining wall height along the bike path would be 16 feet.

City of West Sacramento

The proposed project would require improvements to the existing levee along the West Sacramento side of the river, where the proposed bridge alignment would connect to C Street. The existing levee does not meet current standards required by Title 23 of the California Code of Regulations (CCR). Extending approximately 300 feet north and south of the proposed C Street alignment, the levee cross-section would be reconstructed to meet current design standards, which would require 3:1 side slopes on the landside and waterside of the levee, and a 20-foot-wide crown at the top of the levee. The levee improvements also would include a slurry cutoff wall extending to a depth of 110 feet below the original ground elevation. In addition, the proposed roadway profile would be approximately 6 feet higher than the original ground elevation as it crosses over the levee. In order to maintain access to the levee for inspection and maintenance services, access roads would be constructed from the new roadway to the top of the improved levee section. The proposed grading for the levee would require relocation of the existing water tower that is located along 2nd Street, just north of the proposed C Street alignment. The tower would be relocated to the northwest, approximately 43 feet from its existing location.

The new levee maintenance road also would serve as the future Class I River Walk Park trail extension in West Sacramento. Similar to the trail improvements proposed as part of the project in Sacramento, the trail would be grade-separated under the proposed bridge structure. Cyclists and pedestrians approaching C Street in either direction would have the option to continue along the trail under the new structure, avoiding the need to cross the roadway. Cyclists and pedestrians who are traveling along the trail also would have the option to connect to C Street to cross over the proposed bridge into Sacramento or head west on C Street.

1.2.2 Over-Water Construction-Site Access

Temporary trestles and barges would be used to provide the contractor with access to the river portion of the project area. Together, the trestles and barges would be used to stage construction

materials, provide a working platform for cranes, and for general construction support. The temporary trestles would consist of steel piles that would be driven into place with an impact hammer. Although the temporary work platforms would be removed at the end of the first construction season before the onset of winter, the temporary trestle piles would remain in place for the duration of construction. The barges would be anchored to the river bottom with spud piles that would be driven into place with an impact hammer. Up to two barges would be anchored in the river at one time. The barges would be repositioned in the channel throughout construction only as needed to complete the work. The barges would be removed after bridge construction is completed.

1.2.3 In-Water Construction Activities

In-water construction activities consists of those construction activities below the ordinary high water mark (OHWM). These activities would be limited to the period of May 1 to November 30 during the two construction seasons. This in-water construction window allows sufficient time for most in-water work to be completed within the first "in-water work season", thus limiting the potential impacts on fish and other species from these activities to primarily one construction season. This in-water work window was selected after consideration of agency in-water work restrictions, timing of presence of multiple special-status fish species, timing of breeding seasons for other special-status species in the project area, and other constraints. Other construction activities occurring above the OHWM (e.g., work on the abutments and approach superstructure, and demolition of existing approach structures) would not be limited to the in-water window of May 1 to November 30. Additional information on sequencing of construction activities is provided in Figure 1-4.

In-water construction activities would include the following.

- Installation and removal of 160 steel piles with a vibratory hammer and an impact hammer for the temporary falsework platforms (trestles). The piles would be embedded approximately 70 feet below the original ground elevation, based on preliminary engineering and site analysis.
- Installation and removal of eight steel spud piles with an impact hammer for anchoring barges. The piles would be embedded approximately 40 feet into the substrate, based on preliminary engineering and site analysis.
- Installation of steel sheet piles with a vibratory driver for temporary cofferdams;
- Installation of 100 steel piles for piers 2 and 5 with an impact hammer for the new bridge (although work would occur within dewatered cofferdams, underwater sound would

propagate beyond the dewatered cofferdams). The piles would be embedded approximately 70 feet into the substrate, based on preliminary engineering and site analysis.

- Installation of eight 108-inch-diameter steel casings for piers 3 and 4 with a vibratory hammer and/or hydraulic oscillator/rotator system for the new bridge. The piles would be embedded approximately 140 feet into the substrate, based on preliminary engineering and site analysis.
- Installation of 30 concrete piles with an impact hammer for the new bridge fender system. The piles would be embedded approximately 30 feet into the substrate, based on preliminary engineering and site analysis.
- Installation of RSP at piers 2–5 to prevent erosion.

To reduce the potential for effects on fish during pile driving, the City and/or its contractors will implement several mitigation measures (described in detail in Chapter 4), as well as the following best management practices (BMPs) to further avoid and minimize effects that may arise during the placement and driving of piles and temporary sheet piles for cofferdams, if needed. The cofferdams would be removed once pier column construction is completed.

- Bubble curtains will be installed around piles during impact driving and proofing operations to dampen underwater sound shockwaves (Figure 1-5).
- The construction contractor will conduct several dry or dead blows with the hammer initially to frighten fish away from the pile before the pile is driven or proofed with an impact pile driver. Implementation of several dry or dead blows with the hammer to initially frighten fish away is being proposed because the use of a cushioning block or similar feature would result in more strikes being needed to drive the piles, thereby resulting in a greater chance of exceeding the cumulative sound exposure levels (SELs) without significantly reducing peak SELs.

Figure 1-5. Example of an Unconfined Bubble Curtain and Supporting Frame
(Source: Caltrans 2009)

1.2.4 Above-Water Construction Activities

After the temporary cofferdams are installed around piers 2 and 5, forms would be constructed and concrete poured in the dewatered cofferdams to construct the pile caps. Work would then focus on pier 2 and 5 column construction. After the 108-inch-diameter casings for piers 3 and 4 are installed, a rebar cage would be placed into the pile and concrete would be poured into the steel shell. A cast-in-place concrete pier cap would be placed atop the columns to serve as the substructure.

Work would then focus on constructing the approach superstructure and vertical lift towers. The removable span would be constructed off-site, floated in, and erected once construction of the vertical lift towers is completed.

1.2.5 Storm Water Drainage Management

Drainage for the proposed roadway would be conveyed to the existing storm drain system installed within Railyards Boulevard and C Street. Railyards Boulevard currently drains storm water to the east along the roadway and then into a retention basin south of Railyards Boulevard.

C Street drains storm water west along the roadway and then ultimately south beyond the project limits.

As is standard with all construction projects, the contractor would be required to install temporary BMPs to control any runoff or erosion from the project site into the surrounding waterways. These temporary BMPs would be installed prior to any construction operations and would be in place for the duration of the contract. The removal of these BMPs would be the final operation, along with project site cleanup.

1.2.6 Structure Demolition and Roadway Modifications

Following completion of the new bridge connections at Railyards Boulevard and C Street, traffic would be diverted to the new bridge, and the four existing approach structures to the I Street Bridge would be removed. Bridge numbers 24C0364L, 24C0364R, 22-0033, and 22C0154 would be demolished and the foundations would be removed to a depth of 3 feet below the original ground elevation. Encroachment permits from Caltrans and Union Pacific Railroad would be needed to complete the bridge removal. The existing I Street Bridge is owned and operated by Union Pacific Railroad and would continue to remain in-place and used by trains following construction of the new bridge.

As part of the removal of the existing approach structures, the project would include modifications to I Street within the City of Sacramento from the southbound I-5 on-ramp east to the 5th Street intersection. The modification would include signing and striping revisions, demolition of existing roadway sections that are no longer required, and removal of bridge abutments and foundations.

1.2.7 Staging, Storage, and Proposed Access during Construction

Two staging areas would be used to store materials and equipment during construction, such as pipe materials, precast manholes and drop inlets, steel girders, piles, and rebar, along with the construction equipment when not in use. One area would be located south of Railyards Boulevard under I-5 in Sacramento; the other area would be located west of the landward side of the levee, south of the new bridge location in West Sacramento. The staging area located along Railyards Boulevard would be accessed via the existing intersection at Jibboom Street. The staging area in West Sacramento would be accessed via the existing 2nd Street connection at 3rd Street, south of C Street. The staging areas would be in use throughout the construction duration; the areas would be returned to their pre-project conditions at the completion of the project.

1.2.8 Utility Relocations

A number of public and private utilities would need to be relocated or adjusted to grade as part of the project, including existing water, sewer, gas, electric, and communication facilities within Jibboom Street, Bercut Drive, C Street, and 2nd Street.

1.2.9 Traffic Management and Detours during Construction

While most of the project would be constructed outside of existing roadways, some areas would require temporary detours or staged construction.

Along Jibboom Street at the proposed Railyards Boulevard intersection, the new roadway profile would be raised approximately 6 feet above the original ground elevation. To maintain access to the existing Jibboom Street viaduct south of Railyards Boulevard during the roadway construction, a temporary access road would be needed. The proposed temporary access road would connect to the existing Jibboom Street viaduct abutment approximately 350 feet south of Railyards Boulevard. The temporary road would then continue under I-5 and connect to the Railyards Boulevard/Bercut Drive intersection. The temporary road would require placement of temporary fill material and a roadway structural section that would be removed after construction of the new bridge. Traffic traveling north along Jibboom Street would continue north along Bercut Drive to access the Richards Boulevard/I-5 interchange.

In order to complete the improvements at Jibboom Street and Railyards Boulevard, Jibboom Street would be closed to traffic approximately 600 feet north of Railyards Boulevard. Traffic traveling south along Jibboom Street to continue over the existing I Street Bridge into West Sacramento would be detoured over to Bercut Drive at Richards Boulevard. Traffic would then use the temporary access road to connect to the Jibboom Street viaduct structure. The temporary access road would be in place for approximately 2 years, after which traffic would use the new roadways and new bridge.

The Sacramento River Parkway trail along Jibboom Street also would require temporary re-routing during construction. The temporary alignment for the trail would follow the temporary Jibboom Street alignment south of Railyards Boulevard. Cyclists and pedestrians would then continue following a detour north along Bercut Drive to Richards Boulevard, where they could then connect back to the Parkway on the west side of I-5. The detour would be in place for approximately 2 years.

During construction, traffic along C Street would be maintained along the existing approach structure until the new bridge is constructed.

1.2.10 Project Construction Sequence

New bridge and roadway construction would occur first, followed by demolition of the four approach structures that connect to the existing I Street Bridge. Once the new bridge and roadways are constructed, traffic would be diverted to the new bridge in order to allow demolition adjacent to the existing bridge. Construction of the project is expected to take approximately 30 months.

1.2.11 Property Acquisition

The project would require temporary and permanent property acquisitions along C Street, 3rd Street, and 2nd Street within the City of West Sacramento and along Railyards Boulevard, Jibboom Street, Bercut Drive, and I Street within the City of Sacramento.

Along C Street, temporary and permanent acquisitions would be required along the south side of the roadway to accommodate the construction of standard shoulders, bike lanes, and sidewalks—from the intersection of 4th Street to the Sacramento River.

Along 3rd Street and 2nd Street, temporary and permanent acquisitions would be needed from the Union Pacific Railroad on the south, to just north of the B Street intersections, for construction of the proposed roadway and levee improvements.

Along Railyards Boulevard, Jibboom Street, and Bercut Drive, temporary and permanent acquisition would be needed from the current state-owned right-of-way for I-5, for construction of the roadway. In addition, temporary and permanent acquisitions would be needed along Jibboom Street for the proposed temporary detour road and Class I bikeway improvements.

Temporary acquisition would be required along the existing I Street connection to facilitate removal of the existing viaduct structures. Due to the limited space available in Old Sacramento, it is anticipated that construction activities would occur from the parking lot at the intermodal station.

1.2.12 Proposed Equipment and Construction Schedule

Table 1-2 identifies the type of equipment that would be used to construct the project. Construction is expected to begin in spring 2018 and occur during three (two in-water) construction seasons. It is anticipated that the project would be completed by mid-summer 2020.

Table 1-2. Construction Phases and Equipment

Phase	Equipment	Number per Day
Grubbing/Land Clearing	Excavators	4
	Crawler Tractors	2
Excavation	Scrapers	2
	Front End Loader	2
	Excavators	4
	Dump Truck	20
Embankment	Graders	2
	Drill Rig Truck	2
	Impact Pile Driver	2
	Compactor	2
	Rubber Tired Loaders	2
	Roller	2
	Water Truck	2
Drainage/Utilities/ Sub-Grade	Air Compressor	3
	Generator	3
	Graders	2
	Rough Terrain Forklift	2
	Tractors/Loaders/Backhoes	6
Sub Base	Scraper	2
	Dump Truck	20
	Excavator	2
Levee	Excavator	2
	Slurry Plant	1
	Slurry Trenching	1
Paving	Pavers	1
	Street Sweeper	1
	Paving Equipment	1
	Tractors/Loaders/Backhoes	3
	Rollers	2
Bridge Demo	Hoe Ram	4
	Pneumatic Tools	4
	Chipping Gun	4
	Shears	1
Pile Installation	Impact Pile Driver	2
	Vibratory or Oscillating Pile Drive	2
	Water Pump	2
	Barge	1
	Tug Boat	1
	Crane	1
Concrete Placement	Concrete Truck	18
	Concrete Pump	2
	Welder / Torch	2
	Sand Blaster	2
	Painting	2
Tug boat operations	Tug Boat	1

1.3 Summary of Consultation to Date

During preparation of the BA, ICF International (ICF) (formerly Jones and Stokes) coordinated with NMFS. Coordination with the agency occurred during a meeting and a visit to the project site on November 17, 2015, and through written correspondence. Discussions focused on potential impacts on federally listed and state fully protected species, the construction schedule and timing of activities, and avoidance, minimization, and compensation measures. A detailed summary of this coordination is included in the "Agency Coordination" section in Chapter 2.

A list of federally endangered and threatened species and designated critical habitat under the jurisdiction of NMFS that have the potential to occur in the project vicinity was obtained from the Sacramento office of the NMFS (Rea pers. comm.; Appendix A).

1.4 Document Preparation History

This BA was prepared for the proposed project during 2016 by ICF. Jeff Kozlowski prepared the document and overall review was conducted by ICF project manager, Claire Bromund. Caltrans biologist Jennifer Osmondson reviewed and provided comments on the BA.

ICF prepared a wetland delineation report for the proposed project during 2015. ICF botanist/wetland ecologist Lisa Webber conducted the wetland delineation and prepared the report and overall review was conducted by Claire Bromund (ICF Project Manager). Caltrans biologist Jennifer Osmondson reviewed the wetland delineation report and submitted the report to the USACE. The wetland delineation report is provided in Appendix B.

Chapter 2 Study Methods

2.1 Listed and Proposed Species Potentially in the Biological Study Area

Table 2-1 summarizes the current listing status and critical habitat designations for Federally-listed fish species potentially occurring in the biological study area (BSA). The Sacramento River within the study area currently supports Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run Chinook salmon (*O. tshawytscha*), Central Valley steelhead (*O. mykiss*), and Southern Distinct Population Segment (DPS) of North American green sturgeon (*Acipenser medirostris*), and provides rearing and foraging habitat for Central Valley fall-/late fall–run Chinook salmon (*O. tshawytscha*) (a federal species of concern). In addition, the Sacramento River within the study area is designated as critical habitat for Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, and North American green sturgeon and is considered EFH for Pacific salmon (i.e., all four races of Chinook salmon).

Table 2-1. Current Listing Status and Critical Habitat Designation for Listed Fish Species Potentially Occurring in the Biological Study Area

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Sacramento River winter-run Chinook salmon Evolutionarily Significant Unit (ESU)[a]	*Oncorhynchus tshawytscha*	Endangered—70 Federal Register (FR) 37160; June 28, 2005	Mainstem Sacramento River below Keswick Dam (Moyle 2002); occurs in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 12.5 °C; habitat types are riffles, runs, and pools (Moyle 2002). Adults and juveniles migrate in the lower Sacramento River and through the Delta.	Present, Critical Habitat	Designated—58 FR 33212; June 16, 1993 Sacramento River also considered essential fish habitat (EFH) for Pacific salmon (Chinook salmon).
Central Valley spring-run Chinook salmon ESU[b]	*Oncorhynchus tshawytscha*	Threatened—70 FR 37160; June 28, 2005	Upper Sacramento River, Feather River, and Yuba River and several perennial tributaries of the Sacramento River (Battle, Butte, Clear, Deer, and Mill Creeks); has the same general habitat requirements as winter-run Chinook salmon; coldwater pools are needed for holding adults (Moyle 2002). Adults and juveniles migrate in the lower Sacramento River and through the Delta.	Present, Critical Habitat	Designated— 70 FR 52488; September 2, 2005 Sacramento River is considered EFH for Pacific salmon (Chinook salmon).

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Central Valley Steelhead Distinct Population Segment (DPS)	*Oncorhynchus mykiss*	Threatened—71 Federal Register 834; January 5, 2006	Sacramento and San Joaquin Rivers and tributary Central Valley streams and rivers below impassable barriers; occurs in well-oxygenated, cool, riverine habitat with water temperatures from 7.8 to 18 °C; habitat types are riffles, runs, and pools; adults spawn at head of riffles/tails of pools; young rear year-round for 1–4 years before emigrating to the ocean (Moyle 2002).	Present, Critical Habitat	Designated—70 Federal Register 52488; September 2, 2005
Southern DPS of North American green sturgeon	*Acipenser medirostris*	Threatened—70 FR 17757; April 7, 2006	Sacramento, Klamath, and Trinity Rivers (Moyle 2002). Spawns in large river systems with well-oxygenated water, with temperatures from 8.0 to 14 °C.	Present, Critical Habitat	Designated—74 FR 52300; October 9, 2009
Central Valley fall-/late fall–run Chinook salmon	*Oncorhynchus tshawytscha*	Federal Species of Concern	Sacramento and San Joaquin Rivers and tributary Central Valley streams and rivers below impassable barriers; occurs in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 12.5 °C; habitat types are riffles, runs, and pools; adults spawn at head of riffles/tails of pools; young rear for several months and emigrate to the ocean before summer (Moyle 2002).	Present, Habitat Present	Critical habitat not designated because species is not listed under ESA. Sacramento River is considered EFH for Pacific salmon (Chinook salmon).

[a] Also listed as endangered under California Endangered Species Act (CESA).
[b] Also listed as threatened under CESA.

2.2 Studies Required

Fisheries resources and aquatic resource issues and habitat conditions in the BSA were identified through a review of published and unpublished literature (e.g., Recovery Plan for Central Valley Chinook Salmon and Steelhead [National Marine Fisheries Service 2014]), status review updates, and a list of threatened and endangered species provided by the NMFS and USFWS. The USFWS and NMFS lists of threatened and endangered species are provided in Appendix A.

It was determined that the following study and survey would be required to document natural resources in the BSA and to identify and evaluate the extent and magnitude of impacts on those resources that would result from project implementation.

- Stream habitat survey to map shaded riverine aquatic (SRA) cover—including overhead vegetation, undercut banks, and instream woody material.

2.3 Personnel and Survey Dates

ICF fish biologist Jeff Kozlowski and research assistant Rita Wilson conducted a reconnaissance-level field survey of the study area on May 8, 2015. This survey focused on a shaded riverine aquatic (SRA) cover habitat survey, a fish passage reconnaissance assessment, and a general reconnaissance-level field survey of the Sacramento River within the BSA. The reconnaissance-level field survey focused on evaluating existing habitat conditions within the BSA relative to the needs of special-status fish species. No special-status fish surveys were conducted for the proposed project. In addition, Jeff Kozlowski and Rita Wilson took digital photographs of the banks, levees, and riparian vegetation (including SRA cover vegetation) from the Sacramento River on June 17, 2015.

2.4 Agency Coordination

On June 9, 2015, Jeff Kozlowski, on behalf of Caltrans and the City of Sacramento, and in cooperation with the City of West Sacramento, requested a species list from Maria Rea, Assistant Regional Administrator for NMFS' California Central Valley Area Office for the project.

On August 20, 2015, Caltrans obtained a list from NMFS of all proposed and listed endangered and threatened fish species and designated critical habitat that could occur in the vicinity of the project (Rea pers. comm.; Appendix A).

On October 28, 2015, Caltrans District 3 biologist Jennifer Osmondson sent to the NMFS, USFWS, USACE, and CDFW an email invitation for a November 17, 2015, resource agency

meeting and site visit with project representatives from the Cities of Sacramento and West Sacramento, management and engineering representatives from Mark Thomas and Company, and ICF project management and technical specialist representatives. The purpose of the meeting was to discuss the design of the project and the potential biological impacts, and to get feedback from the agencies regarding likely mitigation requirements.

On November 17, 2015, Ms. Osmondson and representatives of the Cities of Sacramento and West Sacramento, and staff from Caltrans, Mark Thomas and Company, and ICF International attended the resource agency meeting. A summary of the proposed project and preliminary impact results was provided and input from the agencies regarding the impacts and likely mitigation requirements was solicited. Resource agency members in attendance included the following:

- Lieutenant Junior Grade Sean Luis, NMFS, attended the resource agency meeting and site visit, and offered initial feedback regarding the project and in-water work windows.
- Mr. Armin Halston, USFWS, attended the resource agency meeting and offered initial feedback regarding the project. Mr. Halston was not able to participate for the full duration of the meeting or the site visit.
- Ms. Tanya Sheya, CDFW, attended the resource agency meeting and site visit, and offered initial feedback regarding the project and mitigation requirements.
- Staff from the USACE was invited to attend the resource agency meeting but no representatives were able to attend the meeting or site visit.

On January 27, 2016, ICF biologists obtained an updated species list from the USFWS website (U.S. Fish and Wildlife Service 2016; Appendix A).

2.5 Limitations that May Influence Results

No surveys for fish were conducted in the study area and the limited water clarity in Middle River precluded the ability to visually observe fish from the bank. However, the timing of species occurrence in the study area is assumed based on the scientific literature and on the timing of species in the catch by fish sampling surveys conducted in the Sacramento River at Sherwood Harbor by USFWS (U.S. Fish and Wildlife Service 2015a).

Chapter 3 Results: Environmental Setting

This chapter defines the BSA for the proposed project and describes the existing physical and biological conditions within the BSA.

3.1 Description of the Existing Biological and Physical Conditions

3.1.1 Biological Study Area

The extent of the BSA, which includes all permanent and temporary project impact areas, is shown in Figure 3-1. The BSA consists of the Sacramento River, riparian woodland and open space with bike/pedestrian trails along the Sacramento River, local roads, elevated roads (viaducts) and bridge approach structures, residential areas, and commercial development. The BSA has a relatively high level of historical and ongoing disturbance.

NMFS defines the action area as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action" (50 Code of Federal Regulations [CFR] 402.02). Accordingly, the action area includes the BSA defined above and portions of the Sacramento River that could be affected by elevated turbidity, sediment deposition, and underwater noise generated by in- and near-water construction activities. Because pile driving effects are anticipated to extend beyond water quality effects (with BMPs in place), the action area includes areas both upstream and downstream from pile driving activity where pile driving noise may have a physical or behavioral effect on listed species. Based on an analysis of sound expected to be generated by driving 12-inch-diameter steel piles for the temporary trestle without an attenuation device, the 183 decibel (dB) sound exposure level (SEL) accumulated interim criteria (see the pile driving assessment contained in Section 4.1.7.1 for definitions) could be exceeded a distance of up to 1,775 feet (541 meters) upstream and downstream the source. Although noise levels could exceed background levels beyond that point, a distance to any lesser threshold (e.g., 150 dB root mean square, which is sometimes used as a behavioral threshold) cannot be realistically predicted because of the physical geography of the river. The Sacramento River has river channel bends and the straight line distance of open water is 5,400 feet upstream and 5,600 feet downstream of the proposed bridge crossing, and these distances are considerably shorter than the calculated distance (9,600 feet) to which the 150 dB threshold could be exceeded. Consequently, the action area for this project is defined as the entire width of the Sacramento River channel and extending out 2,000 feet beyond the straight-line, open water distances to account for the diffraction and attenuation upstream and downstream of the proposed bridge crossing—that is, 7,400 feet upstream and 7,600 feet

downstream of the proposed bridge crossing (i.e., from approximately RM 58 to approximately RM 61).

3.1.2 Physical Conditions

The BSA is located in the Sacramento Valley subregion of the California Floristic Province (Baldwin et al. 2012:43). The topography in the BSA varies from relatively level to moderate slopes on the Sacramento River levees, and elevations range from approximately -6 to 64 feet above mean sea level.

According to soil data from the Natural Resources Conservation Service, the BSA contains the following five soil map units and water (Natural Resources Conservation Service 2014a).

- Orthents-Urban land complex, 0 to 2 percent slopes (Sacramento County)
- Urban land (Sacramento County)
- Lang sandy loam (Yolo County)
- Lang sandy loam, deep (Yolo County)
- Sycamore silt loam (Yolo County)

The soil profile has been disturbed by development in West Sacramento and construction activity in the Sacramento Railyards area.

Based on the project's Preliminary Geotechnical Report (GEI Consultants 2014), subsurface conditions in the project area are described as follows:

> *The existing borings and cone penetration tests (CPT) performed for levee evaluations on the crest and in the vicinity of the West Sacramento levee (the west end of the planned bridge), encountered approximately 15 feet of loose sand with silt (SP-SM) in the embankment. The sand with silt was underlain by an approximately 9 foot layer of clay (CL), followed by an approximately 16 feet thick layer of sandy silt (ML). The sandy silt was underlain by approximately 35 feet of sand with silt (SP-SM). The apparent densities of the sand with silt ranged from medium dense to very dense. The sand with silt was underlain by approximately 25 feet of very dense gravel (GP), followed by a layer of clay (CL). The maximum depth explored was approximately 115 feet.*
>
> *The existing borings and cone penetration tests on the east end (city of Sacramento) of the planned bridge at the crest of existing levee encountered approximately 6 feet of loose sand with silt (SP-SM). The sand with silt was underlain by approximately 10 feet of loose sand (SP), followed by approximately 7 feet of sandy silt (ML). The sandy silt layer was underlain by approximately 50 feet of sand with silt (SP-SM). The densities of the sand with silt layer varied from loose to medium dense. The sand with silt layer was underlain by an*

121°30'30"W

121°30'20"W

121°30'10"W

38°35'20"N

B St

3rd St

C St

Jibboom St

Railyards Blvd

Sacramento River

I Street Bridge

5

1

2

3

4

5

6

7

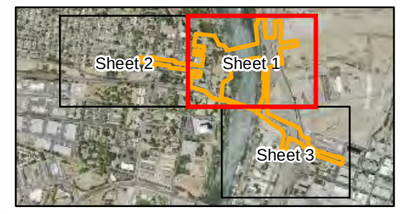
I Street Bridge Replacement Project
Sheet 1

Legend

- Biological Study Area
- Permanent Impacts
- Temporary Impacts
- Staging
- Elderberry Shrubs

Land Cover Types

- Cottonwood Riparian Forest
- Developed/Graded
- Landscaped
- Riparian Forest/Shrub Wetland
- Ruderal Woodland
- Temporary Detention Basin
- Tidal Perennial Stream



N

0 100 200 400
Feet

1 inch = 200 feet

Path: K:\Projects_1\mark_thomas\50203_14_1_St_Bridge\mapdoc\BioFig_3_1_1_LandCover_BA_20160127.mxd Author: . Date: 1/28/2016

Figure 3-1
Impacts on Landcover Types and Sensitive Biological Resources in the Biological Study Area

Figure 3-1
Impacts on Landcover Types and Sensitive Biological Resources in the Biological Study Area

Figure 3-1
Impacts on Landcover Types and Sensitive Biological Resources in the Biological Study Area

approximately 23 feet thick layer of medium dense to very dense gravel (GP), followed by a layer of clay (CL). The maximum depth explored was approximately 110 feet.

The substrate in the Sacramento River channel is sand with silt, overlying sand with gravel and gravel (GEI Consultants 2014).

The BSA is within the Lower Sacramento watershed hydrologic unit (hydrologic unit code [HUC] 18020109) (U.S. Environmental Protection Agency 2015). The primary river in the delineation area is the Sacramento River, a traditional navigable water (TNW) that qualifies as another water of the United States (which also is considered a water of the State). The specific characteristics of waters of the United States (including wetlands) in the BSA are further described below and in the wetland delineation report (Appendix B).

The climate is generally Mediterranean, with cool, wet winters and hot, dry summers. Precipitation occurs primarily in the winter, generally from November to April, with a distinct dry period from May to October. The average total annual precipitation is approximately 18.20 inches (Western Regional Climate Center 2005).

3.1.3 Biological Conditions in the Biological Study Area

The natural communities in the BSA are interspersed with roadways, railroad tracks, commercial and industrial areas, and residential development. The term *land cover type* is used in this BA to refer to vegetation communities, open water, and unvegetated developed or disturbed areas. Land cover types mapped during field surveys are described below and shown in Figure 3-1. Representative photographs of land cover types within the BSA are provided in Appendix C.

The BSA supports both common vegetation communities and natural communities of special concern. Common vegetation communities are habitats with low species diversity that are widespread, reestablish naturally after disturbance, or support primarily non-native species. These communities generally are not protected by agencies unless the specific site is habitat for or supports special-status species (e.g., raptor foraging or nesting habitat, upland habitat in a wetland watershed). Common vegetation communities in the BSA are ruderal woodland and landscaped areas.

The distribution, representative vegetation, and typical wildlife species found in land cover types within the BSA are described below.

Cottonwood Riparian Forest

Cottonwood riparian forest in the BSA occurs along the upper banks and floodplains of the Sacramento River (Figure 3-1). The overstory of riparian forest is predominantly mature

Fremont cottonwood (*Populus fremontii*) trees associated with valley oak (*Quercus lobata*) and black walnut (*Juglans californica* var. *hindsii)*. Other riparian tree species observed include Oregon ash (*Fraxinus latifolia*), boxelder (*Acer negundo* var. *californicum*), and black willow (*Salix gooddingii*). The riparian understory on the waterside of the levee is primarily rip-rap with non-native annual grasses and forbs; however, there are also patches of more typical riparian species, such as narrow-leaf willow (*Salix exigua*), Himalayan blackberry (*Rubus armeniacus*), and mugwort (*Artemisia douglasiana*). The invasive red sesbania (*Sesbania punicea*) shrub was observed in the riparian forest on the Sacramento side of the river. One blue elderberry shrub (*Sambucus nigra* ssp. *caerulea*) was found in riparian habitat on the Sacramento side of the river. One area of riparian forest exhibited positive indicators of all three federal wetland criteria and is discussed below under "Riparian Forest/Shrub Wetland." Riparian forest associated with the Sacramento River in the BSA is depicted in Photos 1 and 2 in Appendix C.

Riparian habitats are sensitive natural communities that provide important habitat for wildlife and SRA cover habitat for fish. Local, state, and federal agencies recognize riparian habitats as sensitive natural communities.

Riparian habitats provide cover, foraging and nesting habitat, and serve as migration and dispersal corridors for several bird and mammal species in the region. Common wildlife species that may occur in these habitats include black phoebe (*Sayornis nigricans*), yellow-rumped warbler (*Dendroica coronata*), house finch (*Carpodacus mexicanus*), American goldfinch (*Carduelis tristis*), yellow-billed magpie (*Pica nuttalli*), pocket gopher (*Thomomys bottae*), fox squirrel (*Sciurus niger*), common muskrat (*Ondatra zibethicus*), and raccoon (*Procyon lotor*).

Riparian Forest/Shrub Wetland

Riparian forest/shrub wetland occurs in the BSA within riparian habitat that meets all three federal wetland criteria (i.e., hydrophytic vegetation, hydric soils, and wetland hydrology). The riparian forest/shrub wetland is located in the northern portion of the BSA, on the west side of the Sacramento River within a low area (Figure 3-1) (Photos 3 and 4 in Appendix C). The vegetative composition of the riparian forest/shrub wetland is predominantly cottonwood but also includes buttonwillow (*Cephalanthus occidentalis* var. *californicus*), boxelder, and narrow-leaf willow. Additional information about the riparian forest/shrub wetland is provided in the wetland delineation report (Appendix B).

As noted above, riparian wetland habitats are sensitive natural communities that provide important cover, foraging, and nesting habitat, and serve as migration and dispersal corridors for several bird and mammal species in the region. Local, state, and federal agencies recognize riparian habitats as sensitive natural communities.

Ruderal Woodland

The West Sacramento section of the BSA includes several areas of naturalized vegetation on undeveloped parcels or parts of parcels that support mature trees with ruderal or non-native annual grassland in the understory. Several parcels between 2nd Street and the levee are predominantly vegetated by the invasive species tree of heaven (*Ailanthus altissima*); several riparian trees are interspersed, including black walnut and Fremont cottonwood. Another invasive tree species, black locust (*Robinia pseudoacacia*), also grows in this area. The understory vegetation in these areas of naturalized vegetation includes non-native annual grasses and forbs, such as wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), foxtail barley (*Hordeum murinum* ssp. *leporinum*), star thistle (*Centaurea solstitialis*), vetch (*Vicia* spp.), and prickly lettuce (*Lactuca serriola*). Several blue elderberry shrubs grow in this community type (Figure 3-1). Representative photographs of ruderal woodland in the BSA are provided as Photos 5, 6, and 7 in Appendix C.

The ruderal woodland and associated ruderal grasslands provide nesting habitat for common birds, including northern mocking bird (*Mimus polyglottos*), western meadowlark (*Sturnella neglecta*), and killdeer (*Charadrius vociferous*) (in more open areas). Mallards from the adjacent river could use the denser areas of ruderal grassland for nesting. This ruderal area also provides foraging habitat for bird species. Pocket gophers are known to occur in the ruderal woodlands of the BSA.

Perennial Stream (Sacramento River)

The Sacramento River is the only perennial stream in the BSA (see Figure 3-1). All perennial stream is unvegetated open water. The river averages 672 feet wide at the mean high water level in the BSA. The river banks are levees that are mostly steeply sloped and support riparian forest vegetation, as described above, with rip-rap near the bottom of the slope. Additional information about the perennial stream is provided in the wetland delineation report (Appendix B). Representative photographs of the Sacramento River in the BSA are provided as Photos 1 and 2 in Appendix C.

The Sacramento River is a TNW and a water of the United States subject to regulation under CWA Section 404 and Section 10 of the RHA, and is under the jurisdiction of the USACE. The river is considered a sensitive natural community. The RWQCB protects all waters of the State under the Porter-Cologne Act.

Riverine habitats like the Sacramento River provide habitat for amphibians, birds, and mammals. Common wildlife species that could be found in the river and along the shore of the river include American bullfrog (*Lithobates catesbeianus*), mallard (*Anas platyrhynchos*), great egret (*Ardea*

alba), and river otter (*Lutra canadensis*). Numerous species of fish also are known to occur in the Sacramento River and are described below.

The Sacramento River in the BSA falls within the Sacramento-San Joaquin Province (Central Valley Subprovince), one of six aquatic zoogeographic provinces in California, as defined by Moyle (2002). The Sacramento-San Joaquin Province is drained by the Sacramento and San Joaquin Rivers. Generally, four native fish assemblages can be recognized in Central Valley streams: rainbow trout assemblage, California roach assemblage, pikeminnow-hardhead-sucker assemblage, and deep-bodied fish assemblage (Moyle 2002). Based on its geographic location, the BSA lies at the interface between the zone characterized by the deep-bodied fish assemblage and the Sacramento-San Joaquin Estuary (i.e., the Delta).

Native fish species that occur where the Sacramento River meets the Delta include Sacramento sucker (*Catostomus occidentalis*), Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento splittail (*Pogonichthys macrolepidotus*), Sacramento blackfish (*Orthodon microlepidotus*), hitch (*Lavinia exilicauda*), Chinook salmon (*Oncorhynchus tshawytscha*) (winter-, spring-, fall-, and late fall–run), steelhead (*O. mykiss*), green sturgeon (*Acipenser medirostris*), white sturgeon (*A. transmontanus*), Pacific lamprey (*Entosphenus tridentata*), river lamprey (*Lampetra ayresi*), delta smelt (*Hypomesus transpacificus*), longfin smelt (*Spirinchus thaleichthys*), tule perch (*Hysterocarpus traski*), and prickly sculpin (*Cottus asper*) (Moyle 2002). The dominant fishes, however, are all nonnative (alien) species: largemouth, smallmouth, and spotted bass (*Micropterus* spp.); white and black crappie (*Pomoxis* spp.); bluegill (*Lepomis macrochirus*); American (*Alosa sapidissima*) and threadfin shad (*Dorosoma petenense*); striped bass (*Morone saxatilis*); bigscale logperch (*Percina macrolepida*); red shiner (*Cyprinella lutrensis*); inland silverside (*Menidia beryllina*); white catfish (*Ameiurus catus*); black and brown bullhead (*Ameiurus* spp.); and common carp (*Cyprinus carpio*) (Moyle 2002).

The Sacramento River is wide and deep and provides unimpeded passage for migratory and resident fish species in the BSA. Although the existing I Street Bridge is supported on three in-water piers, the existing piers do not confine flows or create hydraulic conditions (e.g., shallow water depths or excessive water velocities) that adversely affect the upstream or downstream passage of fish or other aquatic organisms in the Sacramento River.

Landscaped

The vegetation in landscaped areas typically is comprised of ornamental species planted for decorative or landscaping purposes, including oleander (*Nerium oleander*), coast redwood (*Sequoia sempervirens*), California fan palm (*Washingtonia filifera*), Callery pear (*Pyrus*

calleryana), Italian cypress (*Cupressus sempervirens*), pines (*Pinus* spp.), non-native oaks (*Quercus* sp.), and fruit trees (Figure 3-1). Landscaping is depicted in Photo 8 in Appendix C.

Common bird species may forage and nest in some of the landscaped areas, including mourning dove, American robin (*Turdus migratorius*), cliff swallow (*Petrochelidon pyrrhonota*) (nests on buildings and bridges), and western scrub jay (*Aphelocoma californica*).

Developed / Graded

Developed portions of the BSA consist of residential structures, commercial/industrial areas, and paved roadways and parking lots. Some small areas mapped as "Developed" on Figure 3-1 include landscaping, where the vegetated patches are small and interspersed with houses and other structures. Graded portions of the BSA include areas adjacent to roadways, the railroad, unpaved parking areas, and the area underneath and east of I-5. The vegetative composition of these areas is generally sparse and generally consists of nonnative species, particularly annual grasses and weedy forbs. Disturbed/ graded areas are depicted in Photos 9 and 10 in Appendix C.

Common wildlife species that would occur in developed areas would be the same as those described above in the landscaped areas.

3.1.4 Invasive and Nonnative Species

Table 3-2 identifies nonnative fish species that are likely to occur in the BSA. Nonnative fish that commonly occur in the Sacramento River include striped bass, American and threadfin shad, inland silverside, Wakasagi, western mosquitofish, bigscale logperch, black bass (largemouth, smallmouth, spotted, and redeye), and sunfish (bluegill, redear, and green sunfish).

Other invasive aquatic species likely occurring in the BSA include the freshwater clam *Corbicula* (spp.) and several species of aquatic plants (e.g., Brazilian waterweed [*Egeria densa*] and water hyacinth [*Eichhornia crassipes*]).

Chapter 4 Results: Biological Resources, Discussion of Impacts and Mitigation

This chapter describes the effects of the proposed project on federally listed species under jurisdiction of NMFS. *Direct effects* are defined as the direct or immediate effects of a proposed action on a species or its habitat. Direct effects may result from the action and may include the effects of interrelated and interdependent actions. An *interrelated action* is an activity that is part of the proposed action and depends on the proposed action for its justification. An *interdependent action* is an activity that has no independent utility apart from the action under consultation (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998).

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside the area directly affected by the action (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998).

Cumulative effects comprise the effects of future State, local, and private actions not involving a Federal action that are reasonably certain to occur within the action area under consideration (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998). Potential direct, indirect, and cumulative effects are discussed below.

4.1 Sacramento River Winter-Run Chinook Salmon

4.1.1 Status and Distribution

The Sacramento River winter-run Chinook salmon Evolutionarily Significant Unit (ESU) (*Oncorhynchus tshawytscha*) was listed as threatened under ESA on August 4, 1989, under an emergency rule. NMFS subsequently reclassified the ESU as endangered on January 4, 1994, and reaffirmed this listing on June 28, 2005. NMFS designated critical habitat for Sacramento River winter-run Chinook salmon on June 16, 1993 (58 Federal Register [FR] 33212–33219). The ESU includes all naturally spawned populations of winter-run Chinook in the Sacramento River and its tributaries, as well as populations from two artificial propagation programs—one at the Livingston Stone National Fish Hatchery (LSNFH) and the other at Bodega Marine Laboratory (discontinued in 2004) (National Marine Fisheries Service 2005a). The Sacramento River winter-run Chinook salmon ESU was listed as endangered under CESA in September 1989.

Prior to construction of Shasta Dam, winter-run Chinook salmon spawned in the upper reaches of the Sacramento River, the McCloud River, and the lower Pit River. Spawning is now restricted to approximately 44 miles of the mainstem Sacramento River, immediately downstream of Keswick Dam (Yoshiyama et al. 1998). The abundance of winter-run Chinook salmon in the Sacramento River before Shasta Dam was constructed is unknown. Some biologists believe that the run was relatively small, possibly consisting of a few thousand fish (Slater 1963). Others, relying on anecdotal accounts, believe that the run could have numbered more than 200,000 fish (National Marine Fisheries Service 1993). During the mid-1960s, more than 20 years after the construction of Shasta Dam, the population exceeded 80,000 fish (U.S. Department of the Interior, Bureau of Reclamation 1986). The population declined substantially during the 1970s and 1980s.

Historically, four independent populations of winter-run Chinook were delineated in the Sacramento River ESU. The areas used for spawning by three of these populations are now inaccessible because they are above the impassable Keswick and Shasta Dams, while conditions for a fourth population (Battle Creek) are at present unsuitable due to high summer water temperatures. Lindley et al. (2007) concluded that the mainstem Sacramento River population was at a low risk of extinction based on data up to 2004. However, the ESU as a whole is not considered viable because there is only one naturally spawning population that is found outside its historical range. Furthermore, there is some concern over the introgression of naturally-produced fish with hatchery-produced fish from LSNFH, although the risk is still thought to be low when considering extinction risk.

In 1989, winter-run Chinook salmon escapement was estimated at less than 550 adults. Escapement continued to decline, diminishing to an estimated 450 fish in 1990 and 191 fish in 1991. The rapid decline in escapement during the late 1980s and early 1990s prompted listing of the winter-run Chinook salmon as endangered under CESA and ESA. Escapement in 1992 was estimated to be 1,180 fish, indicating good survival of the 1989 class. NMFS's data indicate that the population has increased during the late 1990s through 2001. In 1996, returning spawners numbered about 1,000 fish; and in 2001, returning adults were estimated to be 5,500 (Pacific Fishery Management Council 2002). Despite increased efforts to maintain and enhance the population of winter-run Chinook salmon by various entities, in their final listing determination of June 28, 2005, NMFS again found "that the Sacramento River winter-run Chinook salmon ESU in-total is in danger of extinction throughout all or a significant portion of its range" and concludes that the ESU continues to warrant listing as an endangered species under ESA (National Marine Fisheries Service 2005a).

Like other Chinook populations in the Central Valley, winter-run have declined in abundance since 2005, and the 10-year trend is negative. Recent escapement trends were marked by a general downward trend from an average of approximately 10,700 adults in 2001–2006 to an average of 2,400 adults in 2007–2011 and a low of 827 in 2011 (CalFish 2012). Average run size is associated with a low risk of extinction, but the most recent returns are associated with a moderate risk. In general, the proportion of hatchery fish from LSNFH has ranged from 5 to 10%, with an outlier of 20% in 2005. In 2010, the estimated hatchery escapement was about 12% (CalFish 2010). This is generally consistent with the USFWS goal to keep hatchery escapement to less than 20%. In perspective, the winter-run ESU has shown marked improvement over the critically low abundance and productivity in the 1980s–1990s. The rate of population growth or the cohort replacement rate has been negative through 2010, indicating that it is not self-sustaining. Winter-run Chinook in the Central Valley continue to be at high risk of extinction, and there is nothing to indicate that the risk has diminished (Williams et al. 2011). Longer term reduction in risk will depend on whether the introduction of winter-run into Battle Creek is successful in establishing another population within the winter-run's historical range.

4.1.2 Life History

Table 4-1 summarizes the life stage timing and distribution of winter-run Chinook salmon in the Sacramento River.

Winter-run Chinook salmon spend 1–3 years in the ocean. Adult winter-run Chinook salmon leave the ocean and migrate through the Sacramento–San Joaquin River Delta (Delta) into the Sacramento River from December through July, with peak migration in March (Moyle 2002). Adults spawn from mid-April through mid-August, with peak activity in May and June (Vogel and Marine 1991). Fry emerge from the gravel beginning in late June and continuing through October (Fisher 1994). The primary spawning habitat in the Sacramento River is above Red Bluff Diversion Dam (RBDD) at River Mile (RM) 243, although spawning has been observed downstream as far as RM 218 (National Marine Fisheries Service 2001). Spawning success below RBDD may be limited primarily by warm water temperatures (Hallock and Fisher 1985; Yoshiyama et al. 1998). Spawning and egg incubation do not occur in the study area (Moyle 2002).

Table 4-1. Life Stage Timing and Distribution of Special-Status Fish Species Potentially Affected by the Proposed Project

Species/Life Stage	Distribution	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Winter-Run Chinook Salmon													
Adult migration and holding	San Francisco Bay to upper Sacramento River	■	■	■	■	■	■					■	■
Juvenile movement and rearing	Upper Sacramento River to San Francisco Bay	■	■	■	■							■	■
Spring-Run Chinook Salmon													
Adult migration	San Francisco Bay to upper Sacramento River and tributaries			■	■	■	■	■					
Juvenile movement	Upper Sacramento River and tributaries to San Francisco Bay	■	■	■	■	■					■	■	■
Steelhead													
Adult migration	San Francisco Bay to upper Sacramento River and tributaries	■	■	■						■	■	■	■
Juvenile and smolt movement	Upper Sacramento River and tributaries to San Francisco Bay	■	■	■	■	■	■				■	■	■
Green Sturgeon													
Adult migration and holding	San Francisco Bay to upper Sacramento River		■	■	■	■	■						
Juvenile rearing (natal stream to estuary)	Upper Sacramento River to San Francisco Bay	■	■	■	■	■	■	■	■	■	■	■	■
Juvenile movement and rearing	Upper Sacramento River to San Francisco Bay					■	■	■	■				
Fall-Run Chinook Salmon													
Adult migration and holding	San Francisco Bay to upper Sacramento River and tributaries							■	■	■	■	■	■
Juvenile movement	Upper Sacramento River and tributaries to San Francisco Bay	■	■	■	■	■	■						
Late Fall–Run Chinook Salmon													
Adult migration	San Francisco Bay to upper Sacramento River and tributaries	■	■								■	■	■
Juvenile movement and rearing	Upper Sacramento River and tributaries	■	■	■	■	■	■				■	■	■

Note: Gray shading indicates primary periods of species and life stage occurrence included in the assessment of project effects.
Sources: Wang and Brown 1993; U.S. Fish and Wildlife Service 1996; McEwan 2001; Moyle 2002; Hallock 1989; Beamesderfer et al. 2005.

Downstream movement of juvenile winter-run Chinook salmon begins in August, soon after fry emerge. The peak abundance of juveniles moving downstream at Red Bluff occurs in September and October (Vogel and Marine 1991). Juvenile Chinook salmon move downstream from spawning areas in response to many factors, which may include inherited behavior, habitat availability, flow, competition for space and food, and water temperature. The numbers of juveniles that move and the timing of movement are highly variable. Storm events and their resulting high flows and turbidity appear to trigger downstream movement of substantial numbers of juvenile Chinook salmon.

Winter-run Chinook salmon smolts (i.e., juveniles that are physiologically ready to enter seawater) may migrate through the Delta and San Francisco Bay to the ocean from November through May (Yoshiyama et al. 1998). The Sacramento River channel is the main migration route through the Delta. However, the Yolo Bypass also provides significant outmigration passage during higher flow events.

During winter in the Sacramento–San Joaquin system, juveniles rear on seasonally inundated floodplains. Sommer et al. (2001) found higher growth and survival rates of juvenile Chinook salmon reared on the Yolo Bypass floodplain than those that reared in the mainstem Sacramento River.

4.1.3 Factors Affecting Abundance

One of the main factors in the decline of winter-run Chinook salmon is habitat loss and degradation. On the Sacramento River, Shasta Dam blocked access to historical spawning and rearing habitat. Other factors affecting abundance include the effects of reservoir operations on water temperature, drought effects, passage impediments, harvesting and fishing pressure, entrainment in diversions, contaminants, predation by non-native species, and interaction with hatchery stock (U.S. Army Corps of Engineers 2000).

In the Sacramento River, operation of the Central Valley Project (CVP) and State Water Project (SWP) influences river flow. Low flows can reduce habitat area and adversely affect water quality. The resulting warm water temperatures and low dissolved oxygen levels can stress incubating eggs and rearing juvenile winter-run Chinook salmon. Low flow may affect migration of juveniles and adults through increased water temperature or reduced velocity that slows downstream movement of juveniles. Low flow, in combination with diversions, may result in higher entrainment losses at the state and federal pumping plants in the south Delta (U.S. Army Corps of Engineers 2000).

In the Delta, flow drawn through the Delta Cross Channel (DCC) and Georgiana Slough transports some percentage of downstream migrating salmon into the central Delta. The number of juveniles entering the DCC and Georgiana Slough is assumed to be proportional to the flow volume diverted from the Sacramento River (California Department of Fish and Game 1987). Survival of juvenile Chinook salmon that are drawn into the central Delta is lower than survival of juvenile Chinook salmon that remain in the Sacramento River channel.

Factors such as levee construction and bank armoring have altered the critical habitat of winter-run Chinook salmon. These factors reduce floodplain habitat, change river bank substrate size, and decrease the amount of SRA cover and riparian habitat, which in turn, reduce habitat availability and quality (National Marine Fisheries Service 2006a)

4.1.4 Survey Results

Focused surveys for Sacramento River winter-run Chinook salmon were not conducted. However, it is well documented that winter-run Chinook salmon use the action area as a migration corridor during upstream (adult) and downstream (juvenile) migration. In addition, juvenile winter-run Chinook salmon seasonally use the lower reaches of the Sacramento River for rearing while emigrating to the ocean. Spawning and egg incubation do not occur in the action area (Moyle 2002).

The temporal occurrence and relative abundance of juvenile winter-run Chinook salmon in the action area can be inferred based on the weekly trawl surveys of the Sacramento River at Sherwood Harbor (RM 55) as part of the Delta Juvenile Fish Monitoring Program (DJFMP) (U.S. Fish and Wildlife Service 2015a). Sherwood Harbor is located approximately 4.5 miles downstream of the action area, and the trawls conducted by USFWS provide a consistent and reliable method for observing the timing of occurrence and relative abundance of juvenile winter-run Chinook salmon in the action area. USFWS uses a Kodiak trawl at Sherwood Harbor from December through March and switches to a mid-water trawl beginning in April.

From January 2005 through March 2015, winter-run size juvenile Chinook salmon were detected in the trawls from October through April, although most were detected in the trawls from November through March (Table 4-2).

Table 4-2. Number of Winter-Run Size Juvenile Chinook Salmon Captured by Trawl at Sherwood Harbor (RM 55) by Month (January 2005 through March 2015)

Month/ Year	2005	2006	2007	2008	2009	2010	2011	2012	2013[1]	2014	2015	Monthly Total[2]
Jan	25	4	2	22	1	1		2			3	57
Feb	17	19	53	9	14	7	3	2		45	2	169
Mar	7	37		1			3	24		23	1	95
Apr	1	5					5	1		3		15
May												0
Jun												0
Jul												0
Aug												0
Sep												0
Oct					3	2						5
Nov	30	2			2			48		2		84
Dec	38	38		1		7		26		13		123
Annual Total	**118**	**105**	**55**	**33**	**20**	**17**	**11**	**103**	**0**	**86**	**NA**	**548**

NA = Not applicable.
[1] No winter-run size juvenile Chinook salmon were captured by trawl surveys.
[2] 2015 data are excluded from total because data are incomplete.

Quantification of SRA cover habitat in the BSA was based on a combination of field observations (June 17, 2015) and interpretation of recent aerial photographs, by ICF biologists. USFWS defines *SRA cover* as "the unique, near-shore aquatic cover that occurs at the interface between a stream or river and adjacent woody riparian habitat" and is an essential component of salmonid habitat. Key features of SRA cover include the following.

- An adjacent bank composed of natural, often eroding substrate that supports overhanging riparian vegetation and vegetation that may protrude into the water.
- A stream channel with variable amounts of woody material and detritus, and variable water velocity and depth.

SRA cover is composed of two components: overhead cover and instream cover. Overhead cover consists of overhanging riparian vegetation that provides important stream shading and contributes leaf litter and insects to the stream. Instream cover consists of submerged woody material (exposed roots, branches, and trunks), aquatic plants, substrate (gravel, cobble, and boulders), and undercut banks. These attributes provide high-value feeding areas, burrowing substrates, escape cover, and reproductive cover for numerous regionally important fish and wildlife species. (U.S. Fish and Wildlife Service 1992)

Table 4-3 shows the amount of SRA cover present along both banks of the Sacramento River in the BSA relative to the total bank length.

Table 4-3. Existing Shaded Riverine Aquatic Cover (Overhead Vegetation and Undercut Banks) in the Biological Study Area

River Bank	Existing Bank Length[a] (linear feet)	Existing Overhead Vegetation		Existing Undercut Bank[a] (linear feet)
		Bank Length[a] (linear feet)	Percent Bank Length[a]	
City of Sacramento	900	598	66%	0
City of West Sacramento	752	377	50%	0
Total	**1,652**	**975**	**59%**	**0**

[a] Within the limits of the biological study area.

4.1.5 Critical Habitat

Critical habitat includes those physical and biological features of the habitat that are essential to the conservation of the species and that may require special management consideration or protection. The Sacramento River within the action area, including the aquatic portion of the BSA, is included in the designated critical habitat for Sacramento River winter-run Chinook salmon (58 FR 33212–33219, June 16, 1993). The primary constituent elements of critical habitat in the action area include freshwater rearing habitat with water quantity and quality, natural cover, forage, and passage conditions supporting migration and rearing of winter-run Chinook salmon. Critical habitat for winter-run Chinook salmon in the action area includes the river water column, river bottom, and adjacent riparian zone—up to the ordinary or mean high water elevation—which is used by adults for migration and juveniles for rearing.

4.1.6 Avoidance and Minimization Efforts

Implementation of the following measures would avoid and/or minimize direct and indirect impacts on Sacramento River winter-run Chinook salmon and their designated critical habitat.

Measure 1: Install Orange Construction Fencing between the Construction Area and Adjacent Sensitive Biological Resources

The project proponent and/or their contractor will install orange construction fencing between the construction area and adjacent sensitive biological resource areas. Sensitive biological resources that occur adjacent to the construction area that could be directly affected by the project include natural communities of special concern; special-status wildlife habitats for valley elderberry longhorn beetle; nest sites of Swainson's hawk, purple martin, or other migratory birds; roosting bats; and protected trees to be avoided.

Barrier fencing around sensitive areas will be installed as one of the first orders of work and prior to equipment staging. Before construction begins, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the orange construction fencing, and will place stakes around the sensitive resource sites

to indicate these locations. The protected areas will be designated as environmentally sensitive areas and clearly identified on the construction plans and described in the specifications. To minimize the potential for snakes and other ground-dwelling animals from being caught in the orange construction fencing, the fencing will be placed with at least a 1-foot gap between the ground and the bottom of the orange construction fencing. The exception to this condition is where construction barrier fencing overlaps with erosion control fencing and must be secured to prevent sediment runoff. Barrier fencing will be installed before construction activities are initiated, maintained throughout the construction period, and removed after completion of construction.

Measure 2: Conduct Environmental Awareness Training for Construction Employees

The project proponent will retain a qualified biologist to conduct environmental awareness training for construction crews before project implementation. The awareness training will be provided to all construction personnel and will brief them on the need to avoid effects on sensitive biological resources (e.g., native trees, natural communities of special concern, and special-status species habitats in and adjacent to the construction area). The education program will include a brief review of the special-status species with the potential to occur in the BSA (including their life history, habitat requirements, and photographs of the species). The training will identify the portions of the BSA in which the species may occur, as well as their legal status and protection. The program also will cover the restrictions and guidelines that must be followed by all construction personnel to reduce or avoid effects on these species during project implementation. This will include the steps to be taken if a sensitive species is found within the construction area (i.e., notifying the crew foreman, who will call a designated biologist). In addition, construction employees will be educated about the importance of controlling and preventing the spread of invasive plant infestations. An environmental awareness handout that describes and illustrates sensitive resources to be avoided during project construction and identifies all relevant permit conditions will be provided to each crew member. The crew foreman will be responsible for ensuring that crew members adhere to the guidelines and restrictions. Education programs will be conducted for appropriate new personnel as they are brought on the job during the construction period.

Measure 3: Conduct Periodic Biological Monitoring

The project proponent will retain a qualified biological monitor for the project who will visit the site a minimum of once per week to ensure that fencing around environmentally sensitive areas is intact and that activities are being conducted in accordance with the

agreed upon project schedule and agency conditions of approval. The monitor will provide the project proponent with a monitoring log for each site visit.

Certain activities will require a biological monitor to be present for the duration of the activity or during the initial disturbance of an area to ensure that impacts on special-status species are avoided. The activities that require specific monitoring are identified below in Measures 6, 8, and 10.

Measure 4: Conduct All In-Water Construction Activities between May 1 and November 30 and during Daylight Hours Only

The project proponent will conduct all in-water construction work and pile driving (in-water and shore-based within 250 feet of the Sacramento River), installation of cofferdams, removal of temporary sheet piles, and placement of rock revetment between May 1 and November 30 to avoid or minimize causing disturbance and injury to, or mortality of, special-status fish species in the affected reaches of the Sacramento River. In addition, in-water work will be conducted during daylight hours only to provide fish in the affected reaches of the Sacramento River with an extended quiet period during nighttime hours for feeding and unobstructed passage.

Limiting in-water construction to the May 1–November 30 period would achieve several goals.

- In-water construction activities with the potential to generate harmful levels of underwater noise (e.g., driving piles with an impact hammer) would avoid the primary migration periods of adults and juveniles of special-status fish species.
- The length of the in-water construction period would be maximized, thereby limiting the number of construction seasons that in-water construction would be needed and the number of year classes of fish species that potentially would be exposed to in-water construction effects.

Measure 5: Implement Measures to Minimize Exceedance of Interim Threshold Sound Levels during Pile Driving

The project proponent will require the contractor to implement the following measures, developed in coordination with project design engineers, to minimize the exposure of listed fish species to potentially harmful underwater sounds.

- The contractor will vibrate all piles to the maximum depth possible before using an impact hammer.

- No more than 20 piles will be driven per day, and pile driving with an impact hammer will occur on no more than 75 individual days total during construction.
- During impact driving, the contractor will limit the number of strikes per day to the minimum necessary to complete the work and will limit the total number of hammer strikes to 16,000 strikes per day (i.e., 800 hammer strikes per pile, per day) for piles for the bridge piers and temporary trestles, and 20,000 strikes per day (i.e., 1,000 hammer strikes per pile, per day) for the piles for the bridge fender system.
- The smallest pile driver and minimum force necessary will be used to complete the work.
- During impact driving, the project proponent will require the contractor to use a bubble curtain or similar device to minimize the extent to which the interim peak and cumulative SEL thresholds are exceeded (see Section 4.1.7.1, "Pile Driving Noise").
- No pile driving activity will occur at night, thereby providing fish with an extended quiet period during nighttime hours on days pile driving is being conducted for feeding and unobstructed passage.

Measure 6: Develop and Implement a Hydroacoustic Monitoring Plan

The project proponent and/or its construction contractor will develop and implement a hydroacoustic monitoring plan. The monitoring plan will be submitted to the resource agencies (CDFW, NMFS, and USFWS) for approval at least 60 days before the start of project activities. The plan will include the following requirements.

- The project proponent and/or its construction contractor will monitor underwater noise levels during all impact pile driving activities on land and in water to ensure that peak and cumulative SELs do not exceed estimated values (Table 4-4).
- The monitoring plan will describe the methods and equipment that will be used to document the extent of underwater sounds produced by pile driving, including the number, location, distances, and depths of the hydrophones and associated monitoring equipment.
- The monitoring plan will include a reporting schedule for daily summaries of the hydroacoustic monitoring results and for more comprehensive reports to be provided to the resource agencies on a monthly basis during the pile driving season.
- The daily reports will include the number of piles installed per day; the number of strikes per pile; the interval between strikes; the peak SPL, SEL, and RMS per strike; and the accumulated SEL per day at each monitoring station.
- The project proponent or its contractors will ensure that a qualified fish biologist is on site during impact pile driving to document any occurrences of stressed, injured, or

dead fish. If stressed, injured, or dead fish are observed during pile driving, the project proponent and/or its construction contractor will reduce the number of strikes per day to ensure that fish are no longer showing signs of stress, injury, or mortality.

Measure 7: Protect Water Quality and Prevent Erosion and Sedimentation in Drainages and Wetlands

The project proponent and/or their construction contractor will comply with all construction site BMPs specified in the Water Quality Assessment Report prepared for the project (ICF 2015) and the final SWPPP that will be developed for the project, as well as any other permit conditions to minimize introduction of construction-related contaminants and mobilization of sediment in the Sacramento River and the riparian forest/shrub wetland. Broadly, these BMPs will address soil stabilization, sediment control, wind erosion control, vehicle tracking control, non-storm water management, and waste management practices. The BMPs will be based on the best conventional and best available technology.

The proposed project is subject to storm water quality regulations established under the NPDES, described in Section 402 of the federal CWA. In California, the NPDES program requires that any construction activity disturbing 1 or more acres comply with the statewide General Permit, as authorized by the State Water Board. The General Permit requires elimination or minimization of non-storm water discharges from construction sites and development and implementation of a SWPPP for the site. The primary elements of the SWPPP include the following.

- Description of site characteristics—including runoff and streamflow characteristics and soil erosion hazard—and construction procedures
- Guidelines for proper application of erosion and sediment control BMPs
- Description of measures to prevent and control toxic materials spills
- Description of construction site housekeeping practices

In addition to these primary elements, the SWPPP specifies that the extent of soil and vegetative disturbance would be minimized by control fencing or other means and that the extent of soil disturbed at any given time would be minimized. The SWPPP must be retained at the construction site.

The BMPs will be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable; they are subject to review and approval by the project proponent. The project proponent will perform routine

inspections of the construction area to verify that the BMPs are properly implemented and maintained. The project proponent will notify contractors immediately of a noncompliance issue and will require compliance.

The BMPs will include, but are not limited to, the following.

- All earthwork or foundation activities involving wetlands or the intermittent vegetated stream will occur in the dry season (between May 1 and October 31). All in-water work within the Sacramento River will be conducted between May 1 and November 30 to minimize or avoid potential impacts on sensitive life stages (migration, spawning, egg and embryo incubation, and rearing) of special-status fish species.
- Equipment used in and around drainages and wetlands will be in good working order and free of dripping or leaking engine fluids. All vehicle maintenance will be performed at least 300 feet from all streams. Any necessary equipment washing will be carried out where the water cannot flow into drainages or wetlands.
- Develop a hazardous material spill prevention control and countermeasure plan before construction begins. The plan will include strict onsite handling rules to keep construction and maintenance materials from entering the river, including procedures related to refueling, operating, storing, and staging construction equipment and to preventing and responding to spills. The plan also will identify the parties responsible for monitoring a spill response. During construction, any spills will be cleaned up immediately according to the spill prevention control and countermeasure plan. The project proponent will review and approve the contractors' spill prevention control and countermeasure plan before allowing construction to begin.
- Prohibit the following types of materials from being rinsed or washed into the streets, shoulder areas, or gutters: concrete, solvents and adhesives, thinners, paints, fuels, sawdust, dirt, gasoline, asphalt and concrete saw slurry, and heavily chlorinated water.
- Take any surplus concrete rubble, asphalt, or other rubble from construction to a local landfill.
- Prepare and implement an erosion and sediment control plan for the proposed project that will include the following provisions and protocols. The SWPPP for the project will detail the applications and type of measures and the allowable exposure of unprotected soils.
    - Discharge from dewatering operations, if needed, and runoff from disturbed areas will be made to conform to the water quality requirements of the waste discharge permit issued by the RWQCB.

- Apply temporary erosion control measures, such as sandbagged silt fences, throughout construction of the proposed project and remove them after the working area is stabilized or as directed by the engineer. Soil exposure will be minimized through use of temporary BMPs, groundcover, and stabilization measures. Exposed dust-producing surfaces will be sprinkled daily, if necessary, until wet; this measure will be controlled to avoid producing runoff. Paved roads will be swept daily following construction activities.
- The contractor will conduct periodic maintenance of erosion and sediment control measures.
- Plant an appropriate seed mix of native species on disturbed areas upon completion of construction.
- Cover or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more) that could contribute sediment to waterways.
- Enclose and cover exposed stockpiles of dirt or other loose, granular construction materials that could contribute sediment to waterways. Material stockpiles will be located in non-traffic areas only. Side slopes will not be steeper than 2:1. All stockpile areas will be surrounded by a filter fabric fence and interceptor dike.
- Contain soil and filter runoff from disturbed areas by berms, vegetated filters, silt fencing, straw wattle, plastic sheeting, catch basins, or other means necessary to prevent the escape of sediment from the disturbed area.
- Use other temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) to control erosion from disturbed areas as necessary.
- Avoid earth or organic material from being deposited or placed where it may be directly carried into the channel.

The project proponent also will obtain a 401 Water Quality Certification from the Central Valley RWQCB, which may contain additional BMPs and water quality measures to ensure the protection of water quality.

Measure 8: Monitor Turbidity in the Sacramento River

The project proponent will require the construction contractor to monitor turbidity levels in the Sacramento River during in-water construction activities (e.g., pile driving, extraction of temporary sheet piles used for cofferdams, placement of RSP). Turbidity

will be measured using standard techniques upstream and downstream of the construction area to determine whether changes in ambient turbidity levels exceed 20%, the threshold derived from the Sacramento and San Joaquin Rivers Basins Plan (Central Valley Regional Water Quality Control Board 2011). If it is determined that turbidity levels exceed the 20% threshold, then the project proponent and/or its contractors will adjust work to ensure that turbidity levels do not exceed the 20% threshold.

Measure 9: Implement Cofferdam Restrictions

The following restrictions will be implemented during installation of the cofferdams and cofferdam dewatering.

- The extent of cofferdam footprints will be limited to the minimum necessary to support construction activities.
- Sheet piles used for cofferdams will be installed and removed using a vibratory pile driver.
- Cofferdams will be installed and removed only during the proposed in-water work window (between May 1 and November 30).
- Cofferdams will not be left in place over winter where they could be overtopped by winter/spring flows and when juveniles of listed species are most likely to be present in the construction area.
- All pumps used during dewatering of cofferdams will be screened according to CDFW and NMFS guidelines for screens.
- Cofferdam dewatering and fish rescue/relocation from within cofferdams will commence immediately following cofferdam closure.

Measure 10: Prepare and Implement a Fish Rescue and Relocation Plan

The project proponent and/or its construction contractor will develop and implement a fish rescue and relocation plan to recover any fish trapped in cofferdams. The fish rescue and relocation plan will be submitted to the resource agencies (CDFW, NMFS, and USFWS) for approval at least 60 days before initiating activities to install cofferdams. At a minimum, the plan will include the following.

- A requirement that fish rescue and relocation activities will commence immediately after cofferdam closure and that dewatering has sufficiently lowered water levels inside cofferdams to make it feasible to rescue fish.
- A description of the methods and equipment proposed to collect, transfer, and release all fish trapped within cofferdams. Capture methods may include seining, dip netting,

and/or electrofishing as approved by CDFW, NMFS, and USFWS. The precise methods and equipment to be used will be developed cooperatively by CDFW, NMFS, USFWS, and the project proponent and/or contractor.

- A requirement that only CDFW-, NMFS-, and USFWS-approved fish biologists will conduct the fish rescue and relocation.
- A requirement that fish biologists will contact CDFW, NMFS, and USFWS immediately if any listed species are found dead or injured.
- A requirement that a fish rescue and relocation report be prepared and submitted to CDFW, NMFS, and USFWS within 5 business days following completion of the fish relocation. Data will be provided in tabular form and at a minimum will include the species and number rescued and relocated, approximate size of each fish (or alternatively, approximate size range if large number of individuals are encountered), date and time of their capture, and general condition of all live fish (e.g., good–active with no injuries; fair–reduced activity with some superficial injuries; poor–difficulty swimming/orienting with major injuries). For dead fish, additional data will include fork length and description of injuries and/or possible cause of mortality if it can be determined.

Measure 11: Prevent the Spread or Introduction of Aquatic Invasive Species

The project proponent or its contractors will implement the following actions to prevent the potential spread or introduction of AIS associated with the operation of barges and other in-water construction activities. Species of concern related to the operation of barges and other equipment in the lower Sacramento River include invasive mussels (e.g., quagga mussels [*Dreissena bugensis*] and zebra mussels [*Dreissena polymorpha*]) and aquatic plants (e.g., Brazilian waterweed [*Egeria densa*] and hydrilla [*Hydrilla verticillata*]) (California Department of Fish and Game 2008).

- The project proponent or its contractors will coordinate with the CDFW's Invasive Species Program to ensure that the appropriate BMPs are implemented to prevent the spread or introduction of AIS.
- Educate construction supervisors and managers about the importance of controlling and preventing the spread of AIS.
- Train vessel and equipment operators and maintenance personnel in the recognition and proper prevention, treatment, and disposal of AIS.
- To the extent feasible, prior to departure of vessels from their place of origin and before in-water construction equipment is allowed to operate within the waters of the Sacramento River, thoroughly inspect and remove and dispose of all dirt, mud, plant

matter, and animals from all surfaces that are submerged or may become submerged, or places where water can be held and transferred to the surrounding water.

Measure 12: Minimize or Avoid Temporary Construction Lighting and Permanent Bridge Lighting from Directly Radiating on Water Surfaces of the Sacramento River

The project proponent will minimize or avoid the effects of nighttime lighting on special-status fish species by implementing the following actions.

Temporary Construction Lighting

- Avoiding construction activities at night, to the maximum extent practicable.
- Using the minimal amount of lighting necessary to safely and effectively illuminate the work areas.
- Shielding and focusing lights on work areas and away from the water surface of the Sacramento River, to the maximum extent practicable.

Permanent Bridge Lighting

- Minimizing nighttime lighting of the bridge structure for aesthetic purposes.
- Using the minimal amount of lighting necessary to safely and effectively illuminate vehicular, bicycle, and pedestrian areas on the bridge.
- Shielding and focusing lights on vehicular, bicycle, and pedestrian areas and away from the water surface of the Sacramento River, to the maximum extent practicable.

4.1.7 Project Impacts

The following assessment addresses potential direct and indirect effects of the proposed project on special-status fish species, including listed species, and designated critical habitat (where applicable). Potential project effects on listed species and critical habitat include both short-term and long-term effects. Short-term effects include temporary construction-related impacts on fish and aquatic habitat that may last from a few hours to days (e.g., suspended sediment and turbidity, construction noise, artificial lighting). Long-term effects (addition of overwater structure, loss of aquatic habitat [substrate and water column], loss of SRA cover habitat) typically would last months or years, or would be permanent. These effects are generally due to physical alteration of important habitat attributes of the channel, shoreline, and adjacent bank. Short-term effects on listed fish species were evaluated qualitatively based on general knowledge of the impact mechanisms and species responses to construction actions. Long-term effects were measured in terms of the area and/or linear feet of artificial shade, aquatic habitat, and SRA cover habitat affected by the proposed project.

It should be noted that impacts on special-status fish species and designated critical habitat from project construction discussed below would be the same for all project roadway design alternatives and residential access alternatives, as the design and construction methods for the new bridge would be the same under all alternatives.

4.1.7.1 Direct Effects

Pile Driving Noise

Impact pile driving is of particular concern because of the intensity of sounds and known occurrences of fish kills associated with impact pile driving (Popper and Hastings 2009). The effects of pile driving noise on fish may include behavioral responses, physiological stress, temporary and permanent hearing loss, tissue damage (auditory and non-auditory), and direct mortality (Popper and Hastings 2009). In general, factors that may influence the magnitude of effects include species, life stage, and size of fish; type and size of pile and hammer; frequency and duration of pile driving; site characteristics (e.g., water depth); and distance of fish from the source of the underwater sound.

The primary source of underwater noise associated with the project would be driving the 200 16-inch piles with an impact hammer for the two in-water piers (i.e., piers 2 and 5) and two in-levee abutments (i.e., abutments 1 and 6) for the new bridge, the 160 16-inch piles for the temporary trestle and work platforms, the 60 16-inch piles for the bridge fender system, and the eight 16-inch spud piles for the barges (Figure 1-3). Additional sources of underwater noise associated with the project would occur during installation of the eight 108-inch steel casings for the two in-water piers (i.e., piers 3 and 4) for the lift span with a vibratory hammer and/or hydraulic-driven oscillator/rotator system, and installation and removal of temporary sheet piles with a vibratory hammer for the temporary cofferdams used to isolate the in-water construction areas for bridge piers 2 and 5. Only driving of piles with an impact hammer is expected to produce sound levels that could result in injury to fish.

Table 4-4. I Street Bridge Hydroacoustic Analysis (7-13-15)

Pile Location	Pile Diameter/ Type	Driver	Total Number of Piles to be Installed	Land or Water Installation	Piles per Day	Engineer's Estimate of Strikes per Pile	Total Strikes per Day	Attenuation (dB)	Underwater Sound Level Assumptions					Cumulative SEL at Reference Distance	Transmission Loss Constant	Distance (m) to Threshold			
																Onset of Physical Injury			Behavior RMS dB
																Peak dB	Cumulative SEL dB		
																	Fish ≥ 2 g	Fish < 2 g	
									Peak	SEL	RMS	Reference Distance (m)	Source for Sound Level Assumptions			206 dB	187 dB	183 dB	150 dB
Abutments 1 and 6	16-in diameter steel	Impact	100	Land	20	800	16000	0	198	171	183	10	Caltrans 2014. 20-inch steel pipe driven on land near the San Joaquin River.	213	15	<10	251	251	1,585
	16-in square precast concrete (alternative to 16-in diameter steel above)	Impact	100	Land	20	800	16,000	0	192	174	181	10	Caltrans 2014. 24-inch octagonal concrete pile driven at the Port of Oakland.	216	15	<10	398	398	1,166
Temporary trestle	16-in diameter steel	Impact	160	Water	20	800	16000	0	208	176	187	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River.	218	15	14	541	541	2,929
	16-in diameter steel	Impact	160	Water with attenuation system	20	800	16,000	-5	203	171	182	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River. 5 dB attenuation assumed from bubble curtain or dewatered coffer dam.	213	15	<10	251	251	1,359
Temporary trestle	16-in H pile (alternative to 16-in diameter steel pile above)	Impact	160	Water	20	800	16,000	0	195	170	180	10	Caltrans 2014. 15-inch steel H thick driven at Ballena Isle Marina.	212	15	<10	215	215	1,000
	16-in H pile (alternative to 16-in diameter steel pile above)	Impact	160	Water with attenuation system	20	800	16,000	-5	190	165	175	10	Caltrans 2014. 15-inch steel H thick driven at Ballena Isle Marina. 5 dB attenuation assumed from bubble curtain.	207	15	<10	100	100	464
Piers 2 and 5	16-in diameter steel	Impact	100	Inside dewatered cofferdam	20	800	16,000	-5	203	171	182	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River. 5 dB attenuation assumed from dewatered coffer dam.	213	15	<10	251	251	1,359
	16-in square precast concrete (alternative to 16-in diameter steel above)	Impact	100	Inside dewatered cofferdam	20	800	16,000	-5	183	161	171	10	Caltrans 2014. 24-inch octagonal concrete pile driven at the Port of Oakland. 5 dB attenuation assumed from dewatered coffer dam.	203	15	<10	54	54	251
Bridge Fender System	16-in diameter concrete	Impact	60	Water	20	1,000	20,000	0	188	166	176	10	Caltrans 2014. 24-inch octagonal concrete pile driven at the Port of Oakland.	209	15	<10	117	117	541
	16-in diameter concrete	Impact	60	Water with attenuation system	20	1,000	20,000	-5	183	161	171	10	Caltrans 2014. 24-inch octagonal concrete pile driven at the Port of Oakland. 5 dB attenuation assumed from bubble curtain.	204	15	<10	54	54	251
Spud piles	16-in diameter steel	Impact	8	Water	8	800	6,400	0	208	176	187	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River.	214	15	14	541	541	2,929
	16-in diameter steel	Impact	8	Water with attenuation system	8	800	6,400	-5	203	171	182	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River. 5 dB attenuation assumed from bubble curtain.	209	15	<10	251	251	1,359
Piers 3 and 4	108-in steel casings	Vibratory hammer and/or hydraulic driven oscillator/ rotator system	8	Water	2 weeks/ pile	NA	NA	NA	Vibratory pile driving is not known to cause injury to fish and is therefore not evaluated here. Hydraulic oscillator/rotator systems slowly rotate pile into place and do not generate high underwater noise levels.										

Note 1. Cofferdam sheet piles will be driven with a vibratory driver. Vibratory pile driving is not known to cause injury to fish and is therefore not evaluated.
Note 2. There is limited data available for concrete piles driven on land. Data taken from measurements at the Port of Oakland is used. In this case piles driven on land resulted in higher underwater sound levels than piles driven in water.
Note 3. Pile driving energy does not accumulate once the single strike SEL drops to 150 dB (i.e. “effective quiet”). The distance to the onset of physical injury therefore cannot extend beyond the distance to "effective quiet." Once the daily number of strikes exceeds 5,000 strikes per day the distance to the onset of injury does not increase.
For this reason the distances to the 183 dB and 187 dB thresholds are the same.

Table 4-4 presents a summary of the pile driving assumptions used in the analysis, including assumptions related to pile location (e.g., structure location, land, in-water, in de-watered cofferdam), pile size and type (e.g., steel pipe, steel H pile, concrete), the number of piles to be installed (e.g., total and number per day), type of driver to be used (e.g., impact, vibratory, hydraulic driven oscillator/rotator system), estimated total pile strikes (e.g., per pile and day), sound attenuation (e.g., bubble curtain, dewatered cofferdam, none), and underwater sound level assumptions. Because a specific pile type has not been determined, Table 4-4 presents pile driving assumptions for all possible pile driving scenarios, including with and without sound attenuation (i.e., bubble curtain).

The assessment of underwater noise impacts on fish is based on the overlap of construction activities (timing, location, duration) with the spatial and temporal distribution of sensitive species and life stages (Table 4-1), as well as the expected fish behavior if encountering underwater noise. An important measure for reducing the potential exposure of fish populations to pile driving noise is the restriction of in-water impact pile driving activities to May 1 through November 30, a period when the abundance of special-status fish in the construction area is reduced (Measure 4).

To further minimize direct effects on fish, the project proponents propose to use vibratory driving to drive all piles to the maximum depth possible before using an impact driver to complete the installation and to use sound attenuation measures—including cofferdam dewatering and bubble curtains—and hydroacoustic monitoring to minimize the exposure of special-status fish species to potentially harmful pile driving sounds (Measures 5 and 6). During in-water pile driving activities, the use of an impact driver will be limited to driving only the 16-inch piles that are needed for the piers and abutments of the new bridge, the temporary trestles, and the barges. All of the 108-inch steel casings will be installed with a vibratory hammer and/or hydraulic-driven oscillator/rotator system, and all of the temporary sheet piles for the cofferdams will be installed and extracted using a vibratory driver. Use of a vibratory driver and/or hydraulic-driven oscillator/rotator system to install the 108-inch steel casings and the vibratory driver to install and remove the temporary sheet piles for coffer dams is not expected to produce sound levels that result in injury to fish. Vibratory pile driving is a preferred method for minimizing the exposure of fish to potentially harmful pile driving sounds (National Marine Fisheries Service 2009b). Therefore, the following assessment focuses on the potential for injury to fish based on predicted noise levels associated with impact pile driving.

Because geotechnical information is not yet available, it is unknown how far piles would be advanced with a vibratory hammer before impact driving would be needed to complete the installation. Therefore, the following results are based on the estimated maximum number of

strikes that would be needed with an impact hammer to fully install each pile and represent a worst-case scenario for underwater sound levels. However, actual underwater sound levels from driving piles would likely be less than those levels reported here because some portion of the pile installation is expected to be accomplished with a vibratory hammer, thereby reducing the total number of strikes needed with an impact hammer to install each pile.

Injury Thresholds for Pile Driving Noise

The ability to predict impacts of pile driving noise on listed fish species is currently limited by a lack of information on the key variables and mechanisms linking pile driving sounds with the biological responses of the species of concern (Popper and Hastings 2009). Beginning in 2004, Caltrans—in coordination with the FHWA, Oregon Department of Transportation, and Washington Department of Transportation—established a Fisheries Hydroacoustic Working Group (FHWG) to coordinate and improve information related to the assessment of underwater noise impacts on fish from pile driving. Other member agencies include NMFS (West Coast Region [formerly Northwest and Southwest Regions]), USFWS, and CDFW.

The following assessment is based on application of interim noise criteria established by the FHWG in 2008 (Table 4-5). These criteria, based on recommendations developed by Popper at al. (2006) and revised by Carlson et al. (2007), are considered preliminary thresholds for assessing the potential for injury to listed fish species. The peak sound pressure level (SPL) is considered the maximum SPL a fish can receive from a single strike without injury. The cumulative sound exposure level (SEL) is considered the total amount of acoustic energy that a fish can receive from a single or multiple strikes without injury. Insufficient data are currently available to support the establishment of a noise threshold for behavioral effects (Popper et al. 2006); however, NMFS generally assumes that a noise level of 150 decibels root mean square (dB RMS) is an appropriate threshold for behavioral effects. Technical guidance on the application of these criteria to pile driving projects is presented by ICF Jones & Stokes and Illingworth and Rodkin (2009).

Table 4-5. Interim Criteria for Injury to Fish from Pile Driving Activities

Interim Criteria	Agreement in Principle
Peak sound pressure level (SPL)	206 dB re 1µPa (for all sizes of fish)
Cumulative sound exposure level (SEL)	187 dB re 1µPa^2-sec—for fish size ≥ 2 grams 183 dB re 1µPa^2-sec—for fish size < 2 grams
Behavioral (RMS)	150 dB re 1µPa (for all sizes of fish)

dB = decibel(s)
dB re 1µPa = dB referenced to a pressure of 1 microPascal
dB re 1µPa^2-sec = dB referenced to a pressure of 1 microPascal squared per second
RMS = root mean square

The potential for physical injury to fish from exposure to pile driving sounds was evaluated using the "NMFS Pile Driving Calculator," a spreadsheet model developed by NMFS to calculate the distances from the pile that sound attenuates to the peak or cumulative criteria. These distances define the area in which the criteria are expected to be exceeded as a result of impact pile driving (potential impact area). The NMFS spreadsheet calculates these distances based on estimates of the single-strike sound levels for each pile type (measured at 10 meters [32.8 feet] from the pile) and the rate at which sound attenuates with distance. To account for the exposure of fish to multiple pile driving strikes, the model computes a cumulative SEL for multiple strikes based on the single-strike SEL and the number of strikes per day or pile driving event. Estimated single-strike sound levels were based on measured sound levels produced by similar piles (California Department of Transportation 2009). The standard sound attenuation rate of 4.5 dB per doubling of distance was used in the absence of other data. The estimated number of pile strikes per day was provided by the project engineers. Because juveniles of some species in the project area could be smaller than 2 grams, the cumulative SEL threshold of 183 dB (i.e., the more protective threshold) is used in this analysis. It should be noted, however, that because the estimated daily number of strikes per day exceeds 5,000 strikes, the distance to the onset of physical injury does not increase because pile driving energy does not accumulate once the single strike SEL drops to 150 dB (i.e., "effective quiet"); therefore, the distance to the 183 dB and 187 dB thresholds are the same (see "Note 3" at bottom of Table 4-4).

16-Inch Piles for Temporary Trestles

A total of 160 16-inch piles would be installed to support trestles for the work platforms during construction. The trestles would be installed over a 3 week period in May in the first year of construction and would remain in place throughout the duration of bridge construction (Figure 1-4). It was assumed that up to 20 piles (4–10 piles per day per pile driver, with two pile drivers operating) would be driven in a day, requiring up to 16,000 strikes with the impact hammer to drive and test each pile (Table 4-4). The piles for the temporary trestles would be removed during October of the second construction season once bridge construction is completed. Two pile types are being considered: 16-inch-diameter steel and 16-inch H piles. Both pile types have been evaluated separately for noise impacts.

16-Inch-Diameter Steel Piles for Temporary Trestles

Impact driving of 16-inch-diameter steel piles is expected to produce a single-strike peak SPL of 208 dB and a single-strike SEL of 176 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4); the single-strike peak SPL exceeds the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend 14 meters (46 feet) from the source pile. Based on

an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile, with two pile drivers operating), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 541 meters (1,775 feet) away from the source pile. The project proponents propose to use a bubble curtain to reduce this distance to an estimated 251 meters (824 feet) (Table 4-4).

16-Inch H Piles for Temporary Trestles

Impact driving of 16-inch H piles is expected to produce a single-strike peak SPL of 195 dB and a single-strike SEL of 170 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4). The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile, with two pile drivers operating), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 215 meters (705 feet) away from the source pile. The project proponents propose to use a bubble curtain to reduce this distance to an estimated 100 meters (328 feet) (Table 4-4).

16-Inch Piles for Piers 2 and 5

A total of 100 (50 per pier) 16-inch piles would be installed to construct piers 2 and 5 for the two fixed-span approach structures that would tie into the Sacramento and West Sacramento banks of the river (Figure 1-3). The 16-inch piles for piers 2 and 5 would be installed inside dewatered cofferdams that would be constructed to isolate the construction site from the Sacramento River. The piles would be driven over a 1 week period in May in the first construction season (Figure 1-4). It was assumed that up to 20 piles (4–10 piles per day per pile driver, with two pile drivers operating) would be driven in a day, requiring up to 16,000 strikes with the impact hammer to drive and test each pile (Table 4-4). Two pile types are being considered: 16-inch-diameter steel and 16-inch-square precast concrete piles. Both pile types have been evaluated separately for noise impacts.

16-Inch-Diameter Steel Piles for Piers 2 and 5

Impact driving of 16-inch H piles for piers 2 and 5 in the dewatered cofferdams is expected to produce a single-strike peak SPL of 203 dB and a single-strike SEL of 171 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4).The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 251 meters (824 feet) away from the source pile. Because the piles would be driven in dewatered cofferdams, there are no opportunities to further attenuate noise levels.

16-Inch-Square Precast Concrete Piles for Piers 2 and 5

Impact driving of 16-inch-square concrete piles for piers 2 and 5 in the dewatered cofferdams is expected to produce a single-strike peak SPL of 183 dB and a single-strike SEL of 161 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4).The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 54 meters (177 feet) away from the source pile. Because the piles would be driven in dewatered cofferdams, there are no opportunities to further attenuate noise levels.

16-Inch Piles for Abutments 1 and 6

A total of 100 (50 per abutment) 16-inch piles would be installed to construct abutments 1 and 6 on the West Sacramento and Sacramento banks of the river, respectively (Figure 1-3). The piles would be installed over a 1 week period in May of the second construction season (Figure 1-4). It was assumed that up to 20 piles (4–10 per day per pile driver, with two pile drivers operating) would be driven in a day, requiring up to 16,000 strikes with the impact hammer to drive and test each pile (Table 4-4). Two pile types are being considered: 16-inch-diameter steel and 16-inch-square precast concrete. Both pile types have been evaluated separately for noise impacts because of their proximity to the river.

16-Inch-Diameter Steel Piles for Abutments 1 and 6

Impact driving of 16-inch-diameter piles for abutments 1 and 6 is expected to produce a single-strike peak SPL of 198 dB and a single-strike SEL of 171 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4). The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 251 meters (824 feet) away from the source pile. Because the piles would be driven on land, there are no opportunities to attenuate noise levels.

16-Inch-Square Precast Concrete Piles for Abutments 1 and 6

Impact driving of 16-inch-square precast concrete piles for abutments 1 and 6 is expected to produce a single-strike peak SPL of 192 dB and a single-strike SEL of 174 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4). The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile), cumulative

SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 398 meters (1,306 feet) away from the source pile. Because the piles would be driven on land, there are no opportunities to attenuate noise levels.

16-Inch-Diameter Concrete Piles for Bridge Fender System

A total of 60 (30 per pier) 16-inch-diameter concrete piles would be installed at piers 3 and 4 to construct the bridge fender system for the two movable span piers (Figure 3-1). The fender system would protect the piers from errant watercraft navigating the river. The piles would be installed over a 2-week period in October of the second construction season (Figure 1-4). It was assumed that up to 20 piles per day (4–10 piles per day per pile driver, with two pile drivers operating) would be driven in a day, requiring up to 20,000 strikes with an impact hammer to drive and test each pile (Table 4-4).

Impact driving of 16-inch-diameter concrete piles for the bridge fender system is expected to produce a single-strike peak SPL of 188 dB and a single-strike SEL of 166 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4). The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 20,000 strikes per day (20 piles per day at 1,000 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 117 meters (384 feet) away from the source pile. The project proponents propose to use a bubble curtain to reduce this distance to an estimated 54 meters (177 feet) (Table 4-4).

16-Inch-Diameter Steel Piles for Barge Installation

A total of 8 16-inch-diameter steel piles (spud piles) would be installed to anchor each barge to provide a floating work platform during bridge construction. One to two barges would be used during construction and would be installed over a 1 week period in May of the first and second construction season. The barges would be in use for approximately 24 months and would be moved approximately 4–6 times during anytime of the year. It was assumed that up to 8 piles per day would be driven on the days a barge would be moved, requiring up to 6,400 strikes with an impact hammer to drive each pile (Table 4-4).

Impact driving of 16-inch-diameter steel (spud) piles for the barges is expected to produce a single-strike peak SPL of 208 dB and a single-strike SEL of 176 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4); the single-strike peak SPL exceeds the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend 14 meters (46 feet) from the source pile. Based on an assumed maximum rate of 6,400 strikes per day (8 piles per day at 800 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 541 meters (1,775 feet) away from the source pile. The project

proponents propose to use a bubble curtain to reduce this distance to an estimated 251 meters (824 feet) (Table 4-4).

108-Inch Steel Casings for Piers 3 and 4

A total of 8 (4 per pier) 108-inch steel casings would be installed to construct piers 3 and 4 for the tower foundations (Figure 1-3). The 108-inch steel casings for piers 3 and 4 would be installed with a vibratory pile driver and/or hydraulic-driven oscillator/rotator system; therefore, this method of installation would not generate high underwater noise levels (Table 4-4). It was assumed that it will take approximately 7 weeks to install both 108-inch steel casings. The 108-inch steel casings would be installed from late May through early July in the first construction season (Figure 1-4).

Sheet Piles for Temporary Cofferdams

Two cofferdams would be installed to construct piers 2 and 5 (Figure 1-3). The sheet piles for the cofferdams would be installed and removed with a vibratory pile driver; therefore, this method of installation and removal would not generate high underwater noise levels (Table 4-4). The sheet piles for the two cofferdams would be installed at the same time over a 2 week period in May of the first construction season (Figure 1-4).

Effects of Pile Driving Noise on Fish

The proposed timing of pile driving activities, use of a vibratory hammer to first drive the piles to the maximum depth possible before using an impact driver to complete the installation, and use of sound attenuation measures are expected to minimize the exposure of listed fish species to potentially harmful pile driving sounds. Generally, the potential for injury or mortality of special-status fish species would be greatest for the 16-inch-square precast concrete piles for abutments 1 and 6 and would be the lowest for the 16-inch-square precast concrete piles for piers 2 and 5 driven in dewatered cofferdams and 16-inch-diameter concrete piles driven in water (with attenuation) for the bridge fender system. For the 16-inch-square precast concrete piles for abutments 1 and 6, the potential for injury and mortality would exist within areas of less than 10 meters (32.8 feet) for single-strike exposures and within areas of up to 398 meters (1,306 feet) of the source piles for multiple-strike exposures to impact pile driving sounds. By comparison, for 16-inch-square precast concrete piles for piers 2 and 5 driven in dewatered cofferdams and 16-inch-diameter concrete piles driven in water (with attenuation) for the bridge fender system, the potential for injury and mortality would still exist within areas of less than 10 meters (32.8 feet) of the source piles for single-strike exposures and within areas of up to 54 meters (177 feet) of the source piles for multiple-strike exposures to impact pile driving sounds.

Several factors that could influence the potential exposure and susceptibility of fish to injury from pile driving sounds include the size, mobility, and likely responses of the species and the

life stages of concern. Large, actively migrating adults and juveniles are capable of readily avoiding or migrating through the areas where potential injury may occur. In addition, because of their large size (>600 mm [24 inches]), adult salmonids and green sturgeon would be expected to tolerate higher sound pressures than the levels associated with the onset of injury in smaller fish (Table 4-5), such as juvenile salmonids and species whose individuals are relatively small (e.g., delta and longfin smelt). At a minimum, any adults or juveniles encountering pile driving noise may exhibit some form of behavioral response, including an avoidance response that could disrupt or delay their movement or feeding. Evidence suggests that some fish species avoid or disperse from areas subject to pile driving or other human-generated noises (Popper and Hastings 2009).

Installation of the temporary trestle piles and piles for piers 2 and 5 in May of the first year of construction presents the greatest concern for the potential of injury and mortality of fish from pile driving noise because of the relatively large number of piles (i.e., approximately 160 total piles) that would be installed and the relatively large channel area that would be subject to cumulative sound levels exceeding the injury thresholds (Table 4-4). In addition, relocation of the construction barges is of concern if impact driving is required to install the spud piles to anchor the barges during primary periods of species and life stage occurrence. However, unlike pile driving associated with the temporary trestles and bridge piers, pile driving associated with relocation of the barges would be infrequent (4–6 times over the course of construction) and would require that only 8 piles be driven over the course of one day, per event.

Winter-run, spring-run, fall-run, and late fall–run Chinook salmon, steelhead, green sturgeon, and river lamprey eggs and fry would not be exposed to underwater noise from pile driving activities because these activities are located well downstream of spawning areas or because these life stages would not be present during the proposed in-water construction period. Some overlap with green sturgeon and winter-run and spring-run Chinook salmon adults may occur at the end of the migration season in May and June, with late fall–run Chinook salmon and steelhead adults at the beginning of the migration season in November, and with steelhead and river lamprey adults in November. Adult fall-run Chinook salmon may be exposed to underwater noise from pile driving activities in early July and November, and some fall-run and spring-run Chinook salmon and steelhead smolts may be exposed to underwater noise from pile driving in May and June.

Pile driving associated with relocating the construction barges outside of May 1 to November 30 could potentially overlap peak migration and spawning periods for special-status fish species; however, because it is not known when barges would have to be moved it is not possible to

identify which species and life stages potentially would be affected. However, these pile driving activities would be infrequent and last for less than one day per event.

Based on the predicted levels of underwater noise, pile driving activities could lead to injury and/or direct and indirect mortality if individuals are within the range of noise levels that could cause physical harm or behavioral effects that lead to mortality (e.g., from predation). However, it is likely that only a small proportion of each fish population is at risk, based on the relatively limited overlap of pile driving activities with migration timing.

Although pile driving would occur over many days per season, pile driving will not be continuous and will be limited to daylight hours only, resulting in extended overnight periods each day for migrating fish to pass the construction site undisturbed. In addition, the project proponents propose to drive piles for in-water piers 2 and 5 in dewatered cofferdams and to install the 108-inch-diameter steel casings for in-water piers 3 and 4 using a vibratory hammer and/or hydraulic driven oscillator/rotator system, which would not generate the same underwater noise levels had these piles been driven in water with an impact hammer. Finally, the project proponents will require the contractor to employ sound attenuation devices (e.g., bubble curtains) during in-water pile driving.

Insufficient data are currently available to support the establishment of a noise threshold for behavioral effects (Popper et al. 2006). NMFS generally assumes that a noise level of 150 dB RMS is an appropriate threshold for behavioral effects. During in-water (with attenuation) impact driving of the 16-inch-diameter steel piles for abutments 1 and 6, the spreadsheet calculations indicate that underwater sounds exceeding 150 dB RMS would extend 1,585 meters (approximately 1 mile) from the source piles (Table 4-4). However, these calculations assume an unimpeded open water propagation path over this distance, which is not the case for the Sacramento River. The Sacramento River has major river channel bends within about 1,280 meters (4,200 feet) upstream and 1,830 meters (6,000 feet) downstream from the proposed bridge crossing that will result in diffraction and attenuation of sound waves. Thus, the distance within which 150 dB RMS is exceeded likely would be less than indicated in Table 4-4.

Based on the area of disturbance and timing of pile driving operations, some disturbance to the movement and feeding of special-status fish is anticipated. In addition, pile driving activities would not be continuous but would start and stop during the course of each day of pile driving (including cessation of pile driving activities at night), providing opportunities for fish to continue with their movements and feeding without substantial delays. In addition, general construction noise may act to disperse fish away from the construction area before impact driving is initiated.

Increased Exposure to Contaminants

Disturbance and resuspension of river bottom sediments during in-water construction pose a risk to juvenile and adult winter-run Chinook salmon because of potential increases in the exposure to contaminated sediments.

Sand, silt, and gravel characterize bottom substrate in the BSA. Non-soluble contaminants with a tendency to adsorb[1] to sediments (as opposed to soluble contaminants which have the tendency to be readily diluted in water) can accumulate in the substrate over time. Non-soluble contaminants that are known to be present in the Sacramento River include polychlorinated biphenyls (PCBs), mercury, pesticides and insecticides (i.e., dieldrin, chlorodane, DDT), and other unknown toxicities (State Water Resources Control Board 2011). Resuspension of sediments with adsorbed metals during in-water construction potentially could lead to degradation of water quality and food resources in the action area. In addition, resuspended particulate material could be transported to other locations in the Sacramento River as a result of transport by river currents, thus leading to potential degradation of water quality and food resources beyond the action area. Although special-status fish species may be present in the action area during any month, restricting in-water construction to the May 1–November 30 window will minimize or avoid exposure of most juvenile and adult winter-run Chinook salmon to contaminants because they occur less frequently in the Sacramento River during this time of year (Tables 4-1 and 4-2). Green sturgeon may be more susceptible than other fish species to contaminated sediments because they are more benthic oriented than other species and therefore may come into direct contact with contaminated sediments through ingestion of sediments along with benthic food organisms. In addition, their long life span allows them to accumulate high body burdens of contaminants, which potentially can reach concentrations with deleterious physiological effects.

In-water construction would be limited to pile driving and installation and removal of sheet piles for cofferdams. In addition, in-water construction would be limited to daylight hours each day. Thus, disturbance of channel substrate and the potential for increased contaminants would be temporary and localized. Assuming that mobilization of sediment is also an indication of contaminant mobilization, the proposed in-water construction methods and construction BMPs should minimize the increase in contaminants.

Given the relatively short exposure time and the restricted area of in-water construction relative to the distribution and temporal occurrence of adult and juvenile winter-run Chinook salmon between May 1 and November 30, the effect of contaminants mobilized by in-water construction

[1] *Adsorption* is the adhesion of atoms, ions, or molecules from a gas, liquid, or dissolved solid to a surface—in this case, a sediment particle.

is not expected to result in measurable effects to the survival and growth of winter-run Chinook salmon.

Contaminant Spills

Construction activities that occur in or near the Sacramento River channel can result in the discharge of contaminants that are potentially lethal to fish. The operation of heavy equipment, cranes, pile drivers, drilling rigs, tug boats, and other construction equipment during bridge construction can result in spills and leakage of fuel, lubricants, hydraulic fluids, and coolants. Other sources of potential contamination include asphalt, wet concrete, and other materials that may come into direct contact with surface water during construction activities. For example, concrete that is being poured for the bridge decking could be discharged accidentally to the river, thereby contaminating the river with uncured concrete (which can raise pH) and related compounds.

The potential magnitude of biological effects resulting from contaminants depends on a number of factors, including the proximity of spills to the river; the type, volume, concentration, and solubility of the contaminant; and the timing and duration of the spill or release of the contaminant into the water column. Contaminants can affect survival, growth, and reproductive success of fish and other aquatic organisms. The level of effect depends on the species, life stage sensitivity, duration of exposure, condition or health of exposed individuals, and the physical and chemical properties of the water (e.g., temperature, pH, dissolved oxygen, and other factors).

Implementation of Measure 5 would eliminate or minimize the risk of contaminant spills and the potential effects of any spills on fish and other aquatic organisms.

Erosion and Mobilization of Sediment

Site clearing, earthwork, driving of permanent piles, driving and removal of piles for the temporary trestles, and vibrating and removal of sheet piles for cofferdams will result in disturbance of soil and riverbed sediments, resulting in temporary increases in turbidity and suspended sediments in the Sacramento River. In addition, dewatering and soil removal from the inside of the cofferdams could result in temporary increases in turbidity and suspended sediments in the river, if water (and associated spoils) from within the cofferdams is not properly disposed of or contained and treated before being discharged back to the river.

The potential for disturbance of riverbed sediments and associated increases in sedimentation and turbidity in the Sacramento River are anticipated to be greatest during activities to extract the piles used for the temporary trestles and cofferdams. These activities would result in greater disturbance to riverbed sediments than would occur during pile driving for piers and the bridge fender system; these piles would be driven only and not extracted.

In addition to increasing exposure to contaminants as discussed previously, elevated levels of suspended sediments have the potential to result in physiological, behavioral, and habitat effects related to increased sediment concentrations in the water column. The severity of these effects depends on the sediment concentration, duration of exposure, and sensitivity of the affected life stage. Short-term increases in turbidity and suspended sediment may disrupt normal behavior patterns of fish, potentially affecting foraging, rearing, and migration. The level of disturbance may also cause juveniles to abandon protective habitat or reduce their ability to detect predators, potentially increasing their vulnerability to predators (e.g., striped bass and largemouth bass). Previous studies have documented these effects. For example, juvenile salmonids have been observed to avoid streams that are chronically turbid (Lloyd et al. 1987) or move laterally or downstream to avoid turbidity plumes (Sigler et al. 1984). Bisson and Bilby (1982) reported that juvenile coho salmon avoid turbidities exceeding 70 nephelometric turbidity units (NTUs). Chronic exposure to high turbidity and suspended sediment may affect growth and survival by impairing respiratory function, reducing tolerance to disease and contaminants, and causing physiological stress (Waters 1995). Sigler et al. (1984) found that prolonged exposure to turbidities between 25 and 50 NTUs resulted in reduced growth and increased emigration rates of juvenile coho salmon and steelhead compared to controls. Increased sediment delivery can also smother aquatic invertebrates (a fish food item), degrade forage habitat, and reduce cover for juvenile fish.

Green sturgeon may be at higher risk of exposure to construction-related impacts than other listed species because their benthic nature may make them more likely to encounter sediment plumes that may be more concentrated near the river bottom.

Implementation of Measure 7 would eliminate or minimize the potential for mobilization of sediment and increased sedimentation and turbidity in the Sacramento River. Some harassment of adult and juvenile fish may occur due to temporary, localized plumes of sediment during pile driving and installation and removal of temporary piles and sheet piles. Turbidity would be monitored throughout in-water construction (Measure 8).

Temporary and Permanent Loss of Aquatic Habitat

The proposed project would include the placement of temporary and permanent fill (bridge piers and RSP) below the OHWM and would result in the temporary and permanent loss of aquatic habitat area and volume, including spawning, larval and juvenile transport, rearing, and adult migration habitat for delta smelt. A total of up to 1.85 acre of permanent impacts on perennial stream and delta smelt habitat in the Sacramento River would result from the following bridge components and RSP to be placed below the OHWM (see Table 4-6 below).

- The two fixed-span approach structures for the new bridge would be constructed on center piers (Piers 2 and 5) with foundations each consisting of 50 driven or CIDH piles. The piles would be covered by pile caps and RSP. The footprint for Piers 2 and 5 on the river bottom would total 8,500 square feet (0.20 acre).
- The movable span section of the bridge would be constructed on a foundation of four 9-foot diameter cast-in-steel-shell (CISS) piles in the river bed. The CISS piles, consisting of hollow steel shells, would be driven into the channel bottom using drivers and cranes on the temporary trestle or mounted on barges to temporarily place the steel shells at the desired location for each pile. Once the steel shells are in place, the soil inside the shell would be drilled out, and concrete would be poured into the dewatered hollow shells. The piles would be covered by pile caps and RSP. The footprint for r Piers 3 and 4 on the river bottom would total 1,864 square feet (0.04 acre).
- A bridge fender system would be constructed around the movable span piers that would include approximately 30 driven piles around each pier. The footprint of the bridge fender system on the river bottom would total 85 square feet (0.002 acre).
- RSP (1/4-ton, Method B) would be installed along 1,600 linear feet of shoreline (900 linear feet on City of Sacramento shoreline and 700 linear feet on City of West Sacramento shoreline) below the OHWM. The total volume and area of RSP that would be placed below the OHWM would be up to 2,000 cubic yards and 70,000 square feet (1.61 acre), respectively. In addition, a total of up to 2,000 cubic yards of RSP would be placed above the OHWM.

Temporary impacts on perennial stream and delta smelt habitat would also occur from temporary installation of two cofferdams and trestle piles during bridge construction. Installation of sheet pile cofferdams to isolate the in-water construction areas for piers 2 and 5 from the water column during pier construction would result in the temporary loss of aquatic habitat (substrate and water column) equal to the enclosed area and volume of the in-water cofferdams. The cofferdams would remain in place only during construction of the new bridge piers. The proposed dimensions of each cofferdam are 25 feet by 80 feet, or 2,000 square feet. Together, the two cofferdams would result in a temporary loss of 4,000 square feet (0.09 acre) of substrate habitat and up to 73,640 cubic feet of water column habitat below the OHWM (based on a water surface elevation of +20 feet).

Approximately 141 16-inch-diameter pipe or H piles would be installed below the OHWM to support the temporary trestles, and would result in a temporary loss of 197 square feet (0.005 acre) of substrate habitat and up to 3,573 cubic feet of water column habitat below the OHWM. (Approximately 19 of the 160 piles for the temporary trestles would be installed above the

OHWM). The temporary trestle piles would remain in place throughout the duration of construction.

Installation of these features may result in direct and indirect effects by inhibiting establishment of riparian vegetation; inhibiting recruitment and retention of sediment and woody debris; and eliminating shallow, low-velocity river margins preferred by juvenile fish.

Compensation for impacts on perennial stream and designated critical habitat, as described below, would offset the effects of permanent impacts on the substrate and water column resulting from construction of the new bridge piers.

Table 4-6. Amount of Temporarily and Permanently Affected Aquatic Habitat in the Sacramento River Resulting from the Proposed Project

Feature/Habitat	Temporary Impact	Permanent Impact
Temporary Cofferdams		
Substrate Area (square feet [acre])	4,000 [0.09]	NA
Water Column Volume (cubic feet)	73,640	NA
Temporary Trestle Piles		
Substrate Area (square feet [acre])	197 [0.005]	NA
Water Column Volume (cubic feet)	3,573	NA
Piers 2 and 5		
Substrate Area (square feet [acre])	NA	8,500 [0.20]1
Water Column Volume (cubic feet)	NA	12,250
Piers 3 and 4		
Substrate Area (square feet [acre])	NA	1,864 [0.04]2
Water Column Volume (cubic feet)	NA	17,800
Piles for Bridge Fender System		
Substrate Area (square feet [acre])	NA	85 [0.002]
Water Column Volume (cubic feet)	NA	2,600
Shoreline Rock Revetment (RSP)		
Substrate Area (square feet [acre])	NA	70,000 [1.61]
Water Column Volume (cubic feet)	NA	NA
TOTALS		
Substrate Area (square feet [acre])	4,197 [0.095]	80,449 [1.85]
Water Column Volume (cubic feet)	77,213	32,650

NA = Not applicable

[1] 2,500 sf (pile caps) + 6,000 sf (RSP)

[2] 64 sf (piles) + 1,800 sf (RSP)

Temporary and Permanent Loss of Cottonwood Riparian Habitat (including SRA Cover Habitat)

Clearing of the existing cottonwood riparian forest vegetation within the proposed project footprint would result in the permanent loss of up to 1.44 acres and temporary loss of up to 1.52 acres of cottonwood riparian forest within the BSA, of which approximately 0.44 acre is below the OHWM and contributes to overhead (shade) and instream SRA cover (see additional

discussion below regarding SRA cover). The permanent loss of existing cottonwood forest would result from activities related to construction of the two fixed-span bridge approach structures, the bikeway along Jibboom Street in the City of Sacramento, and the new residential access road connecting B Street and 3rd Street in the City of West Sacramento (Figure 3-1). The temporary loss of cottonwood riparian forest would occur from trimming riparian vegetation and removing additional trees and understory vegetation to provide equipment access. Portions of this affected riparian forest also provide SRA cover habitat that is an important component of anadromous fish habitat (see additional discussion below). Clearing of the existing cottonwood riparian forest that contributes to SRA cover would result in the temporary and permanent loss of up to 890 linear feet (i.e., up to 513 linear feet on the City of Sacramento side of the Sacramento River and up to 377 linear feet on the City of West Sacramento side of the Sacramento River) of overhead SRA cover (shade) along the summer (low-flow) shoreline of the Sacramento River.

Riparian vegetation is important in controlling stream bank erosion, contributing to instream structural diversity, and maintaining undercut banks. In addition, canopy cover (overhanging vegetation [a form of SRA cover]) maintains shade that is necessary to reduce thermal input and provides an energy input to the aquatic habitats in the form of fallen leaves and insects (a food source for fish). SRA cover also provides fish with protection from predators in the form of undercut banks, branches, roots, and instream woody material (e.g., logs).

Without appropriate mitigation, removal of streamside vegetation is likely to adversely affect winter-run Chinook salmon and other fish species because riparian and SRA cover habitat are essential components of salmonid rearing habitat that may limit production and abundance of salmonids in the Sacramento River. Salmonid populations are highly influenced by the amount of available cover (Raleigh et al. 1984). The amount of existing riparian and SRA cover habitat in the BSA and in the region is of variable quality because of past and ongoing impacts, including levee construction and bank protection activities (i.e., placement of rock revetment).

USFWS mitigation policy identifies California’s riparian habitats, including SRA cover habitat, in Resource Category 2. The designation criteria for habitat in Resource Category 2 is "habitat to be impacted is of high quality for evaluation species and is relatively scarce or becoming scarce on a national basis or in the ecoregion section” (U.S. Fish and Wildlife Service 2015b), for which “no net loss of in-kind habitat value” is recommended (46 FR 7644, January 23, 1981). In addition, NMFS recommends re-vegetating onsite at a 3:1 ratio (3 units replaced for every 1 unit of affected habitat) with native riparian species to facilitate the development of SRA cover habitat (Rea pers. comm.; Appendix A).

Compensation for impacts on riparian habitat, including SRA cover habitat, as described below, would offset the effects of temporary and permanent loss of cottonwood riparian forest and SRA cover in the project area.

Fish Entrapment in Cofferdams

Cofferdams would be required in order to construct piers 2 and 5 for the new bridge. Cofferdams would be constructed of sheet piles; when installed, each cofferdam would be approximately 25 feet wide and 80 feet long. The potential exists for entrapment and mortality of fish following closure and dewatering of the cofferdam. The proposed timing of cofferdam installation (May) would avoid the primary period of occurrence of juvenile winter-run Chinook salmon; however, the potential would remain for some special-status fish species to become entrapped in the cofferdams. Implementation of Measures 9 and 10 will further minimize or avoid the risk of mortality for fish potentially stranded during cofferdam installation, closure, and dewatering.

Increase in Direct Lighting on Sacramento River

Temporary lighting of work areas to facilitate nighttime construction, especially at construction sites adjacent to or over the Sacramento River, may result in increased nighttime light intensity on the water surface of the Sacramento River. Increases in direct lighting of the Sacramento River at night may affect the migratory behavior of fish; alter behavior of animals that prey on fish (e.g., piscivorous birds, mammals, and fish) in adjacent and affected habitats; or make juvenile fish more visible to predators, thereby leading to increased mortality of fish through increased predation (Tabor et al. 2001). Implementation of Measure 15 would minimize the potential for effects of lighting on fish, including delta smelt, by requiring shielding and focusing of temporary lights on work areas to avoid and minimize the amount of nighttime lighting that directly radiates on to the Sacramento River, to the extent practicable.

4.1.7.2 Indirect Effects

Construction of the bridge would not promote or allow for urban or commercial development, or expand boating or other recreational activities in the action area; therefore, no indirect effects related to additional development and use of the Sacramento River would occur.

Potential indirect effects on winter-run Chinook salmon and their habitat include changes in impervious surface area and storm runoff; predator/competitor abundance or efficiency; and habitat suitability as a result of over-water structure (artificial shade). These indirect effects are discussed below.

Increases in Impervious Surface Area and Storm Water Runoff

The proposed project would result in added impervious surface which would have the potential to increase runoff volume in the Sacramento River. Increased traffic loads on the new bridge

resulting from improved access could result in increased deposition of particulates onto the bridge deck that could then be transported to the Sacramento River with road runoff.

Heavy metals, oil, grease, and polycyclic aromatic hydrocarbons (PAHs) are common pollutants in road runoff. Some of these pollutants can accumulate in stream sediments with lethal and sublethal consequences for fish and other aquatic species, particularly during "first flush" rain events. PAHs are organic compounds—containing only carbon and hydrogen—that occur in motor vehicle exhaust, petroleum products, materials associated with asphalt, and various other municipal and industrial sources. PAHs are widely distributed in the environment and are important environmental pollutants because of their carcinogenicity and tendency to bioaccumulate. PAHs are readily absorbed by fish and other aquatic organisms and, depending on concentration, can lead to lethal and deleterious sublethal effects in these organisms (Tuvikene 1995). PAHs tend to adsorb to any particulate matter, including fine sediment; therefore, relative concentrations of PAHs in aquatic ecosystems are generally highest in sediments, followed by aquatic biota and the water column (Tuvikene 1995). There is evidence that urban runoff containing roadway sediment may be an important PAH input to aquatic habitats and that a significant contribution to the PAH content of roadway sediment comes from materials associated with asphalt (Wakeham et al. 1980).

Although the new bridge would represent added impervious surface area, the proposed project would not result in a substantial increase in impervious surface area in the action area relative to existing conditions. The new bridge would replace the vehicle portion of the existing I Street Bridge, and existing traffic would be re-routed to the new bridge. In addition, storm water runoff from the new bridge would be directed to the existing storm water collection systems. Therefore, it is not anticipated that a decrease in water quality from added impervious surface area would be an indirect effect of the proposed project.

Increase in Overwater Structure (Artificial Shade)

Overwater structures can alter underwater light conditions and provide potential holding conditions for juvenile and adult fish, including species that prey on juvenile fishes. Temporary shading attributable to the presence of the temporary trestles, work platforms, and barges during bridge construction and permanent shading from the new bridge potentially could reduce primary productivity of affected habitats. Temporary shading also could increase the number of predatory fishes (e.g., striped bass, largemouth bass) holding in the action area and/or their ability to prey on juvenile fishes. Because the temporary trestles, work platforms, and barges would be present only during construction, effects of trestle, work platform, and barge shading would be temporary and localized.

Barge shading would occur year-round during construction of the new bridge. One to two barges, each approximately 60 feet wide and 190 feet long (11,400 square feet [0.26 acre]), would be present during construction and would provide a total of 11,400–22,800 square feet (0.26–0.52 acre) of temporary over-water structure (Table 4-7). Because the barges would be present only during construction and moved periodically as construction of the bridge progresses, effects of barge shading would be temporary and localized.

Shading by the temporary trestles and work platforms would occur year-round during construction of the new bridge. Two trestles, approximately 30 feet wide and varying in length and configuration (Figure 1-3), would be present during construction and would provide a total of approximately 30,000 square feet (0.69 acre) of temporary over-water structure (Table 4-7). Because the trestles and work platforms would be present only during construction, effects of trestle shading would be temporary and localized. Together, the barges and temporary trestles would create up to 52,800 square feet (1.21 acres) of temporary overwater structure (i.e., shade) (Table 4-7).

The new bridge would create approximately 55,000 square feet (1.26 acre) of permanent over-water structure where no over-water structure currently exists. The increased shading created by the new bridge could potentially affect the migration of adult and juvenile winter-run Chinook salmon, and other species. Within the Sammamish River, in Washington State, migrating adult salmon hold in shaded areas beneath bridges (Carrasquero 2001). Juvenile salmonids also prefer shaded areas created by bridges. Because of the height of the new bridge over the water, ambient light levels generally would be expected to penetrate into the water, thereby minimizing the effect of bridge shading on aquatic habitats in the Sacramento River. Compensation for impacts on critical habitat, as described below, would offset the effects of bridge shading on aquatic habitats in the Sacramento River.

Table 4-7. Amount of Artificial Overwater Structure (Shade) on the Sacramento River under Existing and With-Project Conditions

Overwater Structure	Square Feet of Shaded Area		
	Existing Conditions	With-Project Conditions (Barge/Trestle/Bridge)	Change
Barge (Temporary)	0	11,400–22,800[a]	+11,400–22,800[a]
Trestle (Temporary)	0	30,000	+30,000
Bridge (Permanent)	0	55,000	+55,000
Net Change (Temporary)			+41,400–52,800[a]
Net Change (Permanent)			+55,000

NA = Not Applicable.
[a] 1 barge–2 barges.

Introduction of Aquatic Invasive Species

During construction, the operation of barges and other in-water equipment originating from regions or areas outside the project area could result in the introduction and spread of aquatic invasive species (AIS), including the Asian overbite clam (*Corbula amurensis*), quagga mussel (*Dreissena bugensis*), zebra mussel (*Dreissena polymorpha*), hydrilla (*Hydrilla verticillata*), and Brazilian elodea (*Egeria densa*) (California Department of Fish and Game 2008). These species can adversely affect native fishes and other ecologically and economically important species through a number of mechanisms, including competition for resources, predation, parasitism, interbreeding, disease transmission, or changes in the physical or chemical attributes of aquatic habitat. The project proponent will address this impact by implementing Measure 11.

Increase in Direct Lighting on Sacramento River

Permanent lighting associated with the new bridge may result in increased nighttime light intensity on the water surface of the Sacramento River. Increases in direct lighting of the Sacramento River from permanent lighting may have the same effects on fish as described above for temporary lighting, except that the effects associated with permanent lighting of the new bridge could occur indefinitely. Implementation of Measure 12 will minimize the potential for effects of lighting on winter-run Chinook salmon by requiring shielding and focusing of temporary lights on work areas and permanent bridge lighting on the bridge only to avoid and minimize the amount of nighttime lighting that directly radiates on streams, to the extent practicable.

The proposed project is *likely to adversely affect* winter-run Chinook salmon based on temporary effects on water quality (increased turbidity and suspended sediment), rearing and movement habitat (noise and shade), and channel substrates (cofferdams and temporary trestles); temporary and permanent effects on riparian and SRA cover habitat (vegetation removal, bridge and bike path construction) and permanent effects on aquatic habitat (construction of bridge piers, shade, and placement of RSP) in the Sacramento River.

4.1.7.3 Impacts on Sacramento River Winter-Run Chinook Salmon Critical Habitat

The Sacramento River within the action area, which includes the aquatic portion of the BSA, is included in the designated critical habitat for Sacramento River winter-run Chinook salmon (58 FR 33212–33219, June 16, 1993). The primary constituent elements of critical habitat in the action area include freshwater rearing habitat with water quantity and quality, natural cover, forage, and passage conditions supporting migration and rearing of winter-run Chinook salmon. Critical habitat for winter-run Chinook salmon in the action area includes the river water column, river bottom, and adjacent riparian zone—up to the ordinary or mean high water elevation—which is used by adults for migration and juveniles for rearing.

The project is *likely to adversely affect* Sacramento River winter-run Chinook salmon designated critical habitat. Impacts on winter-run Chinook salmon critical habitat include temporary effects on the water column (underwater noise and sound pressure, and water quality impacts) and channel substrate (cofferdams and trestles), and permanent loss of aquatic habitat (water column and substrate) and riparian and SRA cover habitat in the Sacramento River. These impacts would be the same as those discussed above for winter-run Chinook salmon.

With implementation of Measures 1–12, impacts on Sacramento River winter-run Chinook salmon will be avoided or minimized. However, up to 55,000 square feet (1.26 acres) of critical habitat would be permanently impacted, including permanent loss of substrate and water column habitat from new bridge piers and shading of aquatic habitat by the bridge deck. In addition, the project would result in temporary effects to and permanent loss of cottonwood riparian forest, including 0.44 acre of riparian forest below the OHWM that supports SRA cover habitat.

NMFS recommends the purchase of channel enhancement credits at a 3:1 ratio (three acres/linear feet replaced for every acre/foot affected) at an NMFS-approved anadromous fish conservation bank for the footprint of the project area (Rea pers. comm.; Appendix A). In addition, NMFS recommends re-vegetating (preferably onsite) at a 3:1 ratio immediately following completion of the project with native riparian species to facilitate development of SRA cover habitat (Rea pers. comm.; Appendix A).

4.1.8 Modifications to the Project to Mitigate Effects

Implementation of Measure 13 will compensate for the permanent loss of perennial stream. In addition, implementation of Measures 14 and 15 will compensate for permanent impacts on designated critical habitat for Sacramento River winter-run Chinook salmon and loss of riparian vegetation (including SRA cover), respectively.

Measure 13: Compensate for Loss of Perennial Stream

The project proponents will comply with any regulatory requirements determined as part of the state (Section 401 Water Quality Certification or WDRs, LSAA) and federal (Section 404 and Section 10 permits) processes for the work that would occur in the Sacramento River. The project proponent will compensate for the permanent fill of up to 1.85 acre of other waters of the United States in the Sacramento River by purchasing mitigation bank credits, which can be in the form of preservation and/or creation credits using the following minimum ratios.

- A minimum of 2:1 (2 acres of mitigation for each acre filled), for a total of up to 3.7 acres, if credits are for preservation of habitat; or,

- A minimum of 1:1 (1 acre of mitigation for each acre filled), for a total of up to 1.85 acre, if credits are for creation of habitat.

The actual compensation ratios will be determined through coordination with the Central Valley RWQCB and USACE as part of the permitting process. The project proponent will compensate for permanent loss of perennial stream by implementing one or a combination of the following options.

- Purchase credits for created riparian stream channel at a USACE- approved mitigation bank with a service area that encompasses the project area, such as the Cosumnes Floodplain Mitigation Bank, Fremont Landing Conservation Bank, or Elsie Gridley Mitigation Bank. The project proponents will provide written evidence to the resource agencies that compensation has been established through the purchase of mitigation credits.
- Compensate out-of-kind for loss of perennial stream by implementing compensatory mitigation for cottonwood riparian forest impacts described in Measure 4. The acreage restored or created to compensate for loss of perennial stream will be added to the acreage restored or created for loss of riparian habitat.

Measure 14: Purchase Channel Enhancement Credits for Impacts on Critical Habitat

Permanent impacts on critical habitat (bank and substrate below the OHWM and water column habitat), totaling 3.11 acres (up to 80,449 square feet [1.85 acre] from the new bridge piers and RSP and up to 55,000 square feet [1.26 acre] from bridge shading of aquatic habitat) will be mitigated at a 3:1 ratio. The project proponent proposes to mitigate the permanent loss of critical habitat through purchase of 9.33 acres of mitigation credits at a NMFS-approved anadromous fish conservation bank.

Measure 15: Compensate for Temporary Effects to and Permanent Loss of Cottonwood Riparian Forest (including SRA Cover)

The project proponents will compensate for the permanent loss of up to 1.44 acres of riparian forest. In addition, any unavoidable temporary loss of riparian forest will be mitigated. The project proponents will implement onsite and, if necessary, offsite compensation measures and/or purchase mitigation bank credits to compensate for losses of cottonwood riparian forest on the waterside slope of the existing levees, including riparian forest supporting SRA cover habitat (as described above, portions of the cottonwood riparian forest in the BSA also provide SRA cover habitat for fish). Onsite compensation will be used to the maximum extent practicable. Compliance with the

USACE levee vegetation policy (U.S. Army Corps of Engineers 2014), the ULDC (California Department of Water Resources 2012b), or other engineering constraints may limit the ability to achieve full onsite compensation. Therefore, offsite compensation and/or purchase of mitigation bank credits may be needed to achieve no net loss of existing in-kind riparian and SRA cover habitat values. Each of these options is discussed below.

1. **Onsite and/or Offsite Restoration and/or Enhancement along the Sacramento River.** Riparian habitat restoration and/or enhancement onsite or offsite should occur in the same year construction is completed. For onsite or offsite replacement plantings, the project proponents will prepare a mitigation planting plan, including a species list and number of each species, planting locations, and maintenance requirements. Plantings will consist of cuttings taken from local plants or plants grown from local material. Planted species for the mitigation plantings will be similar to those removed from the project area and will include native species, such as Fremont cottonwood, valley oak, black walnut, Oregon ash, boxelder, and black willow. The final planting plan will be developed based on results of the arborist survey for species to be removed (see additional discussion below). All plantings will be fitted with exclusion cages or other suitable protection from herbivory. Plantings will be irrigated for up to 3 years or until established. Plantings will be monitored annually for 3 years or as required in the project permits. If 75 percent of the plants survive at the end of the monitoring period, the re-vegetation will be considered successful. If the survival criterion is not met at the end of the monitoring period, planting and monitoring will be repeated after mortality causes have been identified and corrected.

2. **Mitigation Bank Credit Purchase.** If this option is chosen, the project proponents will provide written evidence to the resource agencies that compensation has been established through the purchase of mitigation credits. The amount to be paid will be the fee that is in effect at the time the fee is paid. The mitigation will be approved by CDFW and may be modified during the permitting process. Mitigation can be in the form of creation and/or preservation credits. If mitigation is in the form of restoration/creation credits, the mitigation will be at a minimum ratio of 1:1 (1 acre of restored or created riparian habitat for each acre of riparian habitat removed). If mitigation is in the form of preservation credits, the mitigation will be at a minimum ratio of 2:1 (2 acres of preserved riparian habitat for each acre of riparian habitat removed). The final compensation ratio will be approved by CDFW in order to result in no net loss of riparian habitat. The project proponent will purchase riparian habitat

credits from an approved mitigation bank near the project, such as the Cosumnes Floodplain Mitigation Bank, Fremont Landing Conservation Bank, or Elsie Gridley Mitigation Bank. Replacement riparian forest habitat will include trees species that would support nesting Swainson's hawk (i.e., oak, cottonwood) and will occur within the range of nesting Swainson's hawk within the Sacramento Valley.

To provide a more accurate estimate of tree loss, an arborist survey will be conducted upon completion of 90% design plans for the project. In addition to a description of the tree, the arborist survey report will include the precise location of the trunk and size of the dripline for all trees whose trunk or canopy overlap with the project footprint. Riparian forest compensation will be consistent with the requirements of the City of West Sacramento and City of Sacramento tree ordinances to ensure compensation for losses of individual protected trees.

In addition to mitigating for the loss of riparian forest habitat, specific measures will be included to compensate for the loss of SRA cover (area and linear feet). However, the acreage will not be duplicated, such that the acreage of riparian forest habitat restored for SRA cover mitigation will apply towards riparian forest habitat mitigation requirements. SRA cover mitigation will include the following riparian replacement requirements:

- Replace the 890 linear feet and 0.44 acres of affected SRA cover vegetation (see "Temporary and Permanent Loss of Cottonwood Riparian Habitat (including SRA Cover Habitat") at a 3:1 replacement ratio (i.e., 3 linear feet replaced for every 1 foot affected and 3 acres replaced for every acre affected) by planting native riparian trees in temporary impact areas and along existing onsite or offsite unshaded banks along the Sacramento River.
- Plant native riparian trees onsite to the maximum extent practicable, followed by planting on adjacent reaches of the Sacramento River to minimize the need for purchasing offsite mitigation bank credits.
- Plant riparian trees that are intended to provide SRA cover along the water's edge at summer low flows up to the OHWM and at sufficient densities to provide shade along at least 85 percent of the bank's length when the trees reach maturity. This will ensure that riparian plantings intended for SRA cover mitigation will contribute to instream SRA cover when they are inundated during winter/spring flows and overhead cover (shade) during summer flows when they approach maturity.
- Monitor and evaluate the re-vegetation success of riparian plantings intended for SRA cover mitigation as described above.

If mitigation for SRA cover is in the form of offsite mitigation bank credits, credits will need to be purchased from an approved mitigation bank within the approved service area for the project that provides riparian forest floodplain conservation credits as off-site compensation for impacts on federally-listed anadromous salmonids, designated critical habitat, and EFH for Pacific salmon.

4.1.9 Cumulative Impacts

Under the ESA, cumulative effects are "those effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area of the federal action subject to consultation" (50 CFR 402.2). Future federal actions that are unrelated to the proposed action are not considered in this assessment because they require separate consultation pursuant to Section 7 of the ESA.

Caltrans is not aware of any future state or private activities that are reasonably certain to affect winter-run Chinook salmon or designated critical habitat within the area potentially affected by the proposed project.

4.2 Central Valley Spring-Run Chinook Salmon

4.2.1 Status and Distribution

The NMFS listed the Central Valley ESU of spring-run Chinook salmon as threatened on September 16, 1999 and reaffirmed this listing on June 28, 2005. The ESU includes naturally spawned populations in the Sacramento River and its tributaries, including the Feather River, and the artificial propagation program at Feather River Fish Hatchery (FRFH). NMFS proposed critical habitat for Central Valley spring-run Chinook salmon on December 10, 2004, and published a final rule designating critical habitat for this ESU on September 2, 2005. The Central Valley spring-run Chinook salmon ESU was listed as threatened under CESA in February 1999.

Spring-run Chinook salmon may have once been the most abundant of Central Valley Chinook salmon (Mills and Fisher 1994), historically occupying the upstream reaches of all major river systems in the Central Valley where there were no natural barriers. The San Joaquin populations were essentially extirpated by the 1940s; and populations in the upper Sacramento, Feather, and Yuba Rivers were eliminated with the construction of major dams during the mid-1900s (Yoshiyama et al. 1998). Naturally spawning populations of spring-run Chinook salmon currently are restricted to accessible reaches of the upper Sacramento River, Antelope Creek, Battle Creek, Beegum Creek, Big Chico Creek, Butte Creek, Clear Creek, Deer Creek, Mill Creek, Feather River, and Yuba River (California Department of Fish and Game 1998).

The abundance of Central Valley spring-run Chinook salmon, as measured by the number of adults returning to spawn, has averaged 7,800 natural spawning adults and 3,900 adults returning to hatcheries from 1993 to 2010 (CalFish 2011). Temporal and spatial overlap between spawning spring-run Chinook salmon and fall-run Chinook salmon in the Sacramento and Feather Rivers brings into question their genetic integrity. Genetically uncontaminated populations may exist in Deer Creek, Mill Creek, Butte Creek, and other eastside tributaries of the Sacramento River, including a growing population in Battle Creek.

The FRFH was constructed by DWR in the mid-1960s to mitigate for the loss of Chinook salmon and steelhead spawning habitat above Oroville Dam. The FRFH is the only hatchery in the Central Valley producing spring-run Chinook salmon. The current annual production target for spring-run Chinook salmon at the FRFH is 2 million smolts. From 2000 to 2009, annual releases of spring-run smolts ranged from approximately 0.75 to 1.3 million smolts (Cavallo et al. 2009).

4.2.2 Life History

Adult spring-run Chinook salmon enter the mainstem Sacramento River from February through September, with the peak upstream migration occurring from May through June (Yoshiyama et al. 1998). Adults generally enter tributaries from the Sacramento River between mid-April and mid-June (National Marine Fisheries Service 2006a). Spring-run Chinook salmon are sexually immature during upstream migration, and adults hold in deep, cold pools near spawning habitat until spawning commences in late summer and fall. Spring-run Chinook salmon spawn in the upper reaches of the mainstem Sacramento River and tributary streams (U.S. Fish and Wildlife Service 1995), with the largest tributary runs occurring in Butte, Deer, and Mill Creeks (Yoshiyama et al. 1998). Spawning typically begins in late August and may continue through October. Juveniles emerge in November and December in most locations but may emerge later when water temperature is cooler. Newly emerged fry remain in shallow, low-velocity edgewater (California Department of Fish and Game 1998).

Juvenile spring-run Chinook salmon typically spend up to 1 year rearing in fresh water before migrating to sea as yearlings, but some may migrate downstream as young-of-year juveniles. Rearing takes place in their natal streams, the mainstem of the Sacramento River, inundated floodplains (including the Sutter and Yolo Bypasses), and the Delta. Based on observations in Butte Creek and the Sacramento River, young-of-year juveniles typically migrate from November through May. Yearling spring-run Chinook salmon migrate from October to March, with peak migration in November (Cramer and Demko 1997; Hill and Webber 1999). Downstream migration of yearlings typically coincides with the onset of the winter storm season, and migration may continue through March (California Department of Fish and Game 1998).

4.2.3 Factors Affecting Abundance

Reasons for the decline and current status of Central Valley spring-run Chinook salmon fall into three general categories: (1) loss of historical spawning habitat; (2) degradation of remaining habitat; and (3) threats to the genetic integrity of the wild spawning populations. The construction of debris, hydropower, flood control, and water supply dams eliminated virtually all historical spawning habitat of spring-run Chinook salmon. Current spawning is restricted to limited areas in mainstem reaches below the lowermost impassable dams and in a few tributaries where the habitat has been degraded by a number of historical and ongoing activities. Major factors that contributed to declines—and that currently limit salmon and steelhead populations—include altered flows and water temperatures from dam operations and water diversions; losses of suitable spawning substrate; channel alterations (e.g., channelization, levees) associated with navigation and flood risk reduction; and associated losses of riparian, floodplain, and wetland habitat.

Land use activities such as agricultural conversion and industrial and urban development have resulted in substantial losses and degradation of salmonid habitat. For example, historical and ongoing land uses in the Feather River downstream of Oroville Dam, including hydraulic mining, gravel mining, levee construction, agricultural encroachment, and urbanization, have resulted in severe constriction and fragmentation of the active floodplain and associated riparian, floodplain, and wetland habitats that once bordered the river (California Department of Water Resources 2004). In addition, levee construction and bank protection have adversely affected salmonid habitat by disrupting the natural erosional processes that create and maintain riparian habitat, SRA cover, and floodplain connectivity. Bank stabilization (e.g., rock revetment) has further simplified the structural and hydraulic characteristics of natural shorelines, eliminating the shallow, low-velocity river margins used by juvenile fish to escape from fast currents, deep water, and predators (U.S. Fish and Wildlife Service 2004).

Habitat blockage by dams poses an additional threat to spring-run Chinook salmon by preventing the spatial and temporal separation between spring-run and fall-run spawners that minimized competition for spawning habitat and maintained the genetic integrity of these runs prior to dams and intensive hatchery programs. For example, overlap in spawning between spring-run and fall-run Chinook salmon in the low-flow channel below Oroville Dam limits spawning success and has likely resulted in significant hybridization of spring-run and fall-run in the Feather River. The continued practice of releasing large numbers of hatchery fall-run and spring-run Chinook salmon in San Pablo Bay results in substantial straying, further contributing the risk of genetic introgression of hatchery and wild stocks of spring-run and fall-run Chinook salmon (National Marine Fisheries Service 2009a).

4.2.4 Survey Results

Focused surveys for Central Valley spring-run Chinook salmon were not conducted. However, it is well documented that spring-run Chinook salmon use the action area as a migration corridor during upstream (adult) and downstream (juvenile) migration. In addition, juvenile spring-run Chinook salmon use the lower reaches of the Sacramento River for rearing while emigrating to the ocean. Spawning and egg incubation do not occur in the action area (Moyle 2002).

The temporal occurrence and relative abundance of juvenile spring-run Chinook salmon in the action area can be inferred based on the weekly trawl surveys of the Sacramento River at Sherwood Harbor (RM 55) as part of the DJFMP (U.S. Fish and Wildlife Service 2015a). From January 2005 through March 2015, spring-run size juvenile Chinook salmon were detected in the trawls from December through May (Table 4-8).

Table 4-8. Number of Spring-Run Size Juvenile Chinook Salmon Captured by Trawl at Sherwood Harbor (RM 55) by Month (January 2005 through March 2015)

Month/ Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Monthly Total[a]
Jan	4	64		9			10	1	1		2	89
Feb	27	74	23	11	2	3	20	1		102	9	263
Mar	67	98	7	2	2	13	9	142		157	1	497
Apr	412	186	123	37	179	148	272	110	390	487		2,344
May	21	110	15	8	41	5	5	4	5	6		220
Jun												0
Jul												0
Aug												0
Sep												0
Oct												0
Nov												0
Dec	27					34		11		21		93
Annual Total	**558**	**532**	**168**	**67**	**224**	**203**	**316**	**269**	**396**	**773**	**NA**	**3,506**

[a] 2015 data excluded from totals.
NA = Not applicable

4.2.5 Critical Habitat

Critical habitat includes those physical and biological features of the habitat that are essential to the conservation of the species and that may require special management consideration or protection. The Sacramento River within the action area, which includes the aquatic portion of the BSA, is included in the designated critical habitat for Central Valley spring-run Chinook salmon (70 FR 52488, September 2, 2005). The primary constituent elements of critical habitat in the action area include freshwater rearing habitat with water quantity and quality, natural cover, forage, and passage conditions supporting migration and rearing of spring-run Chinook salmon. Critical habitat for spring-run Chinook salmon in the action area includes the river water

column, river bottom, and adjacent riparian zone—up to the ordinary or mean high water elevation—which is used by adults for migration and juveniles for rearing.

4.2.6 Avoidance and Minimization Efforts

Implementation of Measures 1–13 would further avoid or minimize the potential for construction-related effects on adult and juvenile spring-run Chinook salmon and designated critical habitat in the action area.

4.2.7 Project Impacts

Project impacts on Central Valley spring-run Chinook salmon would be similar to those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.2.7.1 Impacts on Central Valley Spring-Run Chinook Salmon Critical Habitat

The Sacramento River within the action area, which includes the aquatic portion of the BSA, is included in the designated critical habitat for Central Valley spring-run Chinook salmon (70 FR 52488, September 2, 2005). The primary constituent elements of critical habitat in the BSA include freshwater rearing habitat with water quantity and quality, natural cover, forage, and passage conditions supporting migration and rearing of spring-run Chinook salmon. Critical habitat for spring-run Chinook salmon in the BSA includes the river water column, river bottom, and adjacent riparian zone—up to the ordinary or mean high water elevation—which is used by adults for migration and juveniles for rearing.

4.2.8 Modifications to the Project to Mitigate Effects

Implementation of Measure 13 will compensate for the permanent loss of perennial stream. In addition, implementation of Measures 14 and 15 will compensate for permanent impacts on designated critical habitat for Central Valley spring-run Chinook salmon and loss of riparian vegetation (including SRA cover), respectively. No further compensatory mitigation would be required.

4.2.9 Cumulative Impacts

Cumulative impacts on Central Valley spring-run Chinook salmon would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.3 Central Valley Steelhead

4.3.1 Status and Distribution

The California Central Valley (CCV) steelhead (*Oncorhynchus mykiss*) DPS was federally listed as threatened on March 19, 1998 (National Marine Fisheries Service 1998) (63 FR 13347). The threatened status of CCV steelhead was reaffirmed in NMFS's final listing determination on January 5, 2006 (71 FR 834) (National Marine Fisheries Service 2006a); at the same time, NMFS adopted the term *DPS*, in place of *ESU*, to describe Central Valley steelhead and other population segments of this species. NMFS originally designated critical habitat for CCV steelhead on February 16, 2000 (National Marine Fisheries Service 2000). However, following a lawsuit (*National Association of Home Builders et al. v. Donald L. Evans, Secretary of Commerce, et al.*), NMFS decided to rescind the listing and re-evaluate how to classify critical habitat for several ESUs (now DPSs) of steelhead. Critical habitat for CCV steelhead was redesignated by NMFS on September 2, 2005 (70 FR 52488) (National Marine Fisheries Service 2005b). The DPS includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries. Artificially propagated fish from Coleman National Fish Hatchery and FRFH are included in the DPS (National Marine Fisheries Service 2006a). CCV steelhead are not listed under CESA.

Steelhead ranged throughout the tributaries of the Sacramento and San Joaquin Rivers prior to dam construction, water development, and watershed perturbation dating from the 19th and 20th centuries. Wild stocks are now mostly confined to the upper Sacramento River downstream of Keswick Dam; upper Sacramento River tributaries such as Deer, Mill, and Antelope Creeks; and the Yuba River downstream of Englebright Dam. Populations may also exist in Big Chico and Butte Creeks, and a few wild steelhead are produced in the American and Feather Rivers (McEwan and Jackson 1996). The abundance of naturally reproducing CCV steelhead, as measured by the number of adults returning to spawn, is largely unknown. Natural escapement in 1995 was estimated to be about 1,000 adults each for Mill and Deer Creeks and the Yuba River (S. P. Cramer and Associates 1995). Hatchery returns have averaged around 10,000 adults (Mills and Fisher 1994). The most recent annual estimate of adults spawning upstream of RBDD is less than 2,000 fish (National Marine Fisheries Service 2006a).

4.3.2 Life History

Oncorhynchus mykiss have one of the most complex life histories of any salmonid species, exhibiting both anadromous and freshwater resident life histories. Freshwater residents typically are referred to as rainbow trout, and those exhibiting an anadromous life history are called

steelhead (National Marine Fisheries Service 1999). Steelhead exhibit highly variable life history patterns throughout their range but are broadly categorized into winter and summer reproductive ecotypes. Winter steelhead, the most widespread reproductive ecotype and the only type currently present in Central Valley streams (McEwan and Jackson 1996), become sexually mature in the ocean; enter spawning streams in summer, fall, or winter; and spawn a few months later in winter or late spring (Meehan and Bjornn 1991; Behnke 1992).

In the Sacramento River, adult winter steelhead migrate upstream during most months of the year, beginning in July, peaking in September, and continuing through February or March (Hallock 1987). Spawning occurs primarily from January through March but may begin as early as late December and may extend through April (Hallock 1987). Individual steelhead may spawn more than once, returning to the ocean between each spawning migration.

Juvenile steelhead rear a minimum of 1 year, and typically 2 or more years, in fresh water before migrating to the ocean as smolts. Juvenile migration to the ocean generally occurs from December through August. The peak months of juvenile migration are January to May (McEwan 2001). The importance of main channel and floodplain habitats to steelhead in the lower Sacramento River and upper Delta is not well understood. Steelhead smolts have been found in the Yolo Bypass during winter and spring inundation (Sommer pers. comm.), but the importance of this and other floodplain areas in the lower Sacramento River and upper Delta is not yet clear.

4.3.3 Factors Affecting Abundance

The decline in steelhead populations is attributable to changes in habitat quality and quantity. The availability of steelhead habitat in the Central Valley has been reduced by as much as 95% or more due to barriers created by dams (National Marine Fisheries Service 1996). Populations have been most severely affected by dams blocking access to the headwaters of all major tributaries; consequently, most runs are maintained through artificial production. The decline of naturally produced Central Valley steelhead has been more precipitous than that of hatchery stocks. Populations in the range's southern portion have experienced the most severe declines. Other factors contributing to the decline of steelhead in the Central Valley are mining, agriculture, urbanization, logging, harvest, hatchery influences, flow management (including reservoir operations), hydropower generation, and water diversion and extraction (National Marine Fisheries Service 1996).

Factors such as levee construction and bank armoring have altered the critical habitat of steelhead. These factors reduce floodplain habitat, change river bank substrate size, and decrease the amount of riparian and SRA habitat, which in turn, reduce habitat availability and quality (National Marine Fisheries Service 2006a).

4.3.4 Survey Results

Focused surveys for Central Valley steelhead were not conducted. However, it is well documented that steelhead use the action area, which includes the aquatic portion of the BSA, as a migration corridor during upstream (adult) and downstream (juvenile) migration. In addition, juvenile steelhead seasonally use the lower reaches of the Sacramento River for rearing while emigrating to the ocean. Spawning and egg incubation do not occur in the action area (Moyle 2002).

The temporal occurrence and relative abundance of juvenile steelhead in the action area can be inferred based on the weekly trawl surveys of the Sacramento River at Sherwood Harbor (RM 55) as part of the DJFMP (U.S. Fish and Wildlife Service 2015a). From January 2005 through March 2015, adipose fin-clipped juvenile steelhead (indicating hatchery origin) and unclipped (wild) steelhead were detected in the trawls from January through June (Table 4-9).

Table 4-9. Total Number of Wild (Unclipped) and Hatchery (Adipose Fin-Clipped) Juvenile Steelhead Captured by Trawl at Sherwood Harbor (Rivermile 55) by Month (January 2005 through March 2015)[a]

Month/ Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Monthly Total[b]
Jan	23(1)	4	1	13(1)	11	1	3	34(1)	3	1	1	94(3)
Feb	44	36(2)	33(1)	42	45	31(4)	23	81(5)	3	256(5)	8	594(17)
Mar	19	12	1	1	3	1	11	13	1	12(3)		74(3)
Apr	6(1)		3(1)		1	6(2)	1	4(1)	3(2)	4(1)		28(8)
May	5(2)	1	3		2(2)	1(1)	1(1)	2(1)	1(1)			16(8)
Jun		1(1)	1(1)				1(1)					3(3)
Jul												
Aug												
Sep												
Oct												
Nov												
Dec												
Annual Total	**97(4)**	**54(3)**	**42(3)**	**56(1)**	**62(2)**	**40(7)**	**40(2)**	**134(8)**	**11(3)**	**273(9)**	**NA**	**809(42)**

[a] Number of unclipped (wild) steelhead in parentheses.
[b] 2015 data excluded from totals.
NA = Not applicable

4.3.5 Critical Habitat

Critical habitat includes those physical and biological features of the habitat that are essential to the conservation of the species and that may require special management consideration or protection. The Sacramento River within the action area, which includes the aquatic portion of the BSA, is included in the designated critical habitat for Central Valley steelhead (70 FR 52488, September 2, 2005). The primary constituent elements of critical habitat in the action include

freshwater rearing habitat with water quantity and quality, natural cover, forage, and passage conditions supporting migration and rearing of steelhead. Critical habitat for Central Valley steelhead in the action includes the river water column, river bottom, and adjacent riparian zone—up to the ordinary or mean high water elevation—which is used by adults for migration and juveniles for rearing.

4.3.6 Avoidance and Minimization Efforts

Implementation of Measures 1–13 will further avoid or minimize the potential for construction-related effects on adult and juvenile Central Valley steelhead and designated critical habitat in the action area.

4.3.7 Project Impacts

Project impacts on Central Valley steelhead would be similar to those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.3.7.1 Impacts on Central Valley Steelhead Critical Habitat

The Sacramento River within the action area, which includes the aquatic portion of the BSA, is included in the designated critical habitat for Central Valley steelhead (70 FR 52488, September 2, 2005). The primary constituent elements of critical habitat in the action area include freshwater rearing habitat with water quantity and quality, natural cover, forage, and passage conditions supporting migration and rearing of steelhead. Critical habitat for Central Valley steelhead in the action area includes the river water column, river bottom, and adjacent riparian zone—up to the ordinary or mean high water elevation—which is used by adults for migration and juveniles for rearing.

4.3.8 Modifications to the Project to Mitigate Effects

Implementation of Measure 13 will compensate for the permanent loss of perennial stream. In addition, implementation of Measures 14 and 15 will compensate for permanent impacts on designated critical habitat for Central Valley steelhead and loss of riparian vegetation (including SRA cover), respectively. No further compensatory mitigation would be required.

4.3.9 Cumulative Impacts

Cumulative effects on Central Valley steelhead would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.4 Southern Distinct Population Segment of North American Green Sturgeon

4.4.1 Status and Distribution

NMFS listed the southern DPS of North American green sturgeon as threatened under ESA on April 7, 2006 (National Marine Fisheries Service 2006b). The southern DPS includes the spawning population in the Sacramento River and Feather River (Moyle 2002; Van Eenennaam et. al. 2005). Critical habitat was designated by NMFS on October 9, 2009 (74 FR 52300).

On January 23, 2003, NMFS determined that green sturgeon (*Acipenser medirostris*) are comprised of two populations, a northern and a southern DPS (National Marine Fisheries Service 2003). The northern DPS includes populations extending from the Eel River northward, and the southern DPS includes populations south of the Eel River to the Sacramento River. The Sacramento River supports the southernmost spawning population of green sturgeon (Moyle 2002). On April 6, 2005, NMFS determined that the northern DPS does not warrant listing under ESA, but it remains on the Species of Concern List (National Marine Fisheries Service 2005c). On April 7, 2006, NMFS determined that the southern DPS of green sturgeon was threatened under ESA (National Marine Fisheries Service 2006b). On October 9, 2009, NMFS (74 FR 52300) designated critical habitat for the green sturgeon southern DPS throughout most of its occupied range.

Green sturgeon were classified as a Class 1 species of special concern by CDFW in 1995 (Moyle et al. 1995). Class 1 species of special concern are those that conform to the State definitions of threatened or endangered and could qualify for addition to the official list. On March 20, 2006, emergency green sturgeon regulations were put into effect by CDFW, requiring a year-round zero bag limit of green sturgeon in all areas of the state (California Department of Fish and Game 2006).

4.4.2 Life History

The green sturgeon is anadromous, but it is the most marine-oriented of the sturgeon species and has been found in nearshore marine waters from Mexico to the Bering Sea (Colway and Stevenson 2007; Moyle 2002; National Marine Fisheries Service 2005c). The northern DPS has included spawning populations in the Rogue, Klamath, and Eel Rivers. The southern DPS has two spawning populations, in the Sacramento River and Feather River (Van Eenennaam 2005; National Marine Fisheries Service 2005d, 2010). Adults typically migrate upstream into rivers between late February and late July. Spawning occurs from March to July, with peak spawning from mid-April to mid-June. Green sturgeon are believed to spawn every 3–5 years, although

recent evidence indicates that spawning may be as frequent as every 2 years (National Marine Fisheries Service 2005c, 2010).

Preferred spawning habitats are thought to contain large cobble in deep and cool pools with turbulent water (California Department of Fish and Game 2002; Moyle 2002; Adams et al. 2002). Little is known about the specific spawning habitat preferences of green sturgeon. Adult green sturgeon are believed to broadcast their eggs in deep, fast water over large cobble substrate, where the eggs settle into the interstitial spaces (Moyle 2002). Spawning is generally associated with water temperatures from 46 to 57 degrees Fahrenheit (°F). In the Central Valley, spawning occurs in the Sacramento River upstream of Hamilton City, perhaps as far upstream as Keswick Dam (Adams et al. 2002), and possibly in the lower Feather River (Van Eenennaam 2005; Moyle 2002). Water temperatures in spawning and egg incubation areas are critical; temperatures greater than 19 degrees Celsius (°C) (66.2°F) are lethal to green sturgeon embryos (Cech et al. 2000; Mayfield and Cech 2004; Van Eenennaam et al. 2005; Allen et al. 2006). Green sturgeon eggs hatch in approximately 8 days at 55°F (Moyle 2002). After 6 days, the larvae exhibit nocturnal swim-up activity (Deng et al. 2002). After about 10 days, they begin nocturnal downstream migrational movements (Kynard et al. 2005). Juvenile green sturgeon continue to exhibit nocturnal behavior beyond the metamorphosis from larval to juvenile stages. Larvae begin feeding 10 days after hatching. Young green sturgeon appear to rear for the first 1 to 2 months in the upper Sacramento River between Keswick Dam and Hamilton City (California Department of Fish and Game 2002). Metamorphosis to the juvenile stage is complete within 45 days of hatching. Juveniles spend 1 to 4 years in fresh and estuarine waters and migrate to salt water (Nakamoto et al. 1995) at lengths of 300–750 mm (National Marine Fisheries Service 2005c).

Little is known about movements, habitat use, and feeding habits of green sturgeon. Green sturgeon have been salvaged at the state and federal fish collection facilities in every month, indicating that they are present in the Delta year-round. Juveniles and adults are reported to feed on benthic invertebrates, including shrimp and amphipods, and small fish (National Marine Fisheries Service 2005c).

4.4.3 Factors Affecting Abundance

The historical decline of the southern DPS of green sturgeon has been largely attributed to the reduction of spawning habitat area. Keswick and Shasta Dams on the Sacramento River and Oroville Dam on the Feather River are impassable barriers that prevent green sturgeon from accessing what were likely historical spawning grounds upstream of these dams. Other potential migration barriers or impediments include RBDD, the Sacramento Deep Water Ship Channel locks, Fremont Weir, Sutter Bypass, the Delta Cross Channel in the Sacramento River, and

Shanghai Bench and Sunset Pumps on the Feather River. Other factors that have been identified as potential threats to green sturgeon are reductions in freshwater outflow in the Delta during larval dispersal and rearing, high water temperatures during spawning and incubation, entrainment by water diversions, contaminants, predation and other impacts by introduced species, and poaching (National Marine Fisheries Service 2005c).

Channelization of the lower Sacramento River has resulted in the removal of riparian and IWM, which simplify ecosystem functions. Simplification results in reduced food input and pollutant and nutrient processing (Sweeney et al. 2004 as cited in National Marine Fisheries Service 2006a). These factors have degraded habitat quality for larvae and post-larvae and, to a lesser extent, rearing and migrating juvenile and/or adult green sturgeon (National Marine Fisheries Service 2006a).

4.4.4 Survey Results

Focused surveys for North American green sturgeon were not conducted. However, it is well documented that green sturgeon use the action area, which includes the aquatic portion of the BSA, as a migration corridor during upstream (adult) and downstream (juvenile) migration. In addition, juvenile green sturgeon use the lower reaches of the Sacramento River for seasonal rearing. Spawning and egg incubation do not occur in the action area (Moyle 2002).

Green sturgeon, which are benthic-oriented, generally are not susceptible to the USFWS trawls that sample the water column; therefore, little is known about their seasonal use of habitats and relative abundance in the action area. However, general information on their distribution and habitat use indicates that green sturgeon have the potential to occur in the action area year-round.

4.4.5 Critical Habitat

Critical habitat includes those physical and biological features of the habitat that are essential to the conservation of the species and that may require special management consideration or protection. The Sacramento River within the action area, which includes the aquatic portion of the BSA, is included in the designated critical habitat for the southern DPS of North American green sturgeon (74 FR 52300, October 9, 2009). The primary constituent elements of critical habitat in the action area include freshwater areas with water flow, water quality, depth, forage, sediment quality, and passage conditions supporting migration and rearing of green sturgeon. Critical habitat for North American green sturgeon in the action area includes the river water column, river bottom, and adjacent riparian zone—up to the ordinary or mean high water elevation—which is used by adults for migration and juveniles for rearing.

4.4.6 Avoidance and Minimization Efforts

Implementation of Measures 1–13 will further avoid or minimize the potential for construction-related effects on adult and juvenile North American green sturgeon and designated critical habitat in the action area.

4.4.7 Project Impacts

Project impacts on North American green sturgeon would be similar to those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.4.7.1 Impacts on North American Green Sturgeon Critical Habitat

The Sacramento River within the action area, which includes the aquatic portion of the BSA, is included in the designated critical habitat for the southern DPS of North American green sturgeon (74 FR 52300, October 9, 2009). The primary constituent elements of critical habitat in the action area include freshwater areas with water flow, water quality, depth, forage, sediment quality, and passage conditions supporting migration and rearing of green sturgeon. Critical habitat for North American green sturgeon in the action area includes the river water column, river bottom, and adjacent riparian zone—up to the ordinary or mean high water elevation—which is used by adults for migration and juveniles for rearing.

4.4.8 Modifications to the Project to Mitigate Effects

Implementation of Measure 13 will compensate for the permanent loss of perennial stream. In addition, implementation of Measures 14 and 15 will compensate for permanent impacts on designated critical habitat for North American green sturgeon and loss of riparian vegetation (including SRA cover), respectively. No further compensatory mitigation would be required.

4.4.9 Cumulative Impacts

Cumulative effects on North American green sturgeon would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

4.5 Interrelated and Interdependent Actions

Caltrans does not anticipate any interrelated or interdependent actions associated with the proposed project.

4.6 Essential Fish Habitat

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires federal agencies to consult with the National Oceanic and Atmospheric Administration (NOAA)

Fisheries on activities that may adversely affect EFH. Important components of EFH are substrate; water quality; water quantity, depth, and velocity; channel gradient and stability; food; cover and habitat complexity; space; access and passage; and habitat connectivity.

EFH for Chinook salmon could be affected by the project. The MSA-managed species occurring in the Sacramento River and in the action area, which includes the aquatic portion of the BSA, and potentially affected by the project include Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, and Central Valley fall- and late fall–run Chinook salmon. The species account for Central Valley fall- and late fall–run Chinook salmon is included below.

4.6.1 Central Valley Fall- and Late Fall–Run Chinook Salmon

4.6.1.1 Status and Distribution

The Central Valley fall-run and late fall–run Chinook salmon ESU includes all naturally spawning populations of fall-run and late fall–run Chinook salmon in the Sacramento and San Joaquin River basins and their tributaries east of the Carquinez Strait in California (64 FR 50394). On September 16, 1999, after reviewing the best available scientific and commercial information, NMFS determined that listing Central Valley fall- and late fall–run Chinook salmon was not warranted. On April 15, 2004, the Central Valley fall- and late fall–run Chinook salmon ESU was identified by NMFS as a species of concern (69 FR 19975).

The Central Valley fall- and late fall–run Chinook salmon ESU is not listed under CESA. However, Central Valley late fall–run Chinook salmon was classified as a Class 2 species of special concern by CDFG (now CDFW) in 1995 (Moyle et al. 1995). Class 2 species of special concern are species with low, scattered, or highly localized populations and require active management to prevent them from becoming Class 1 Species (i.e., species that conform to the state definitions of threatened or endangered species) (Moyle et al. 1995.)

Central Valley fall-run Chinook salmon historically spawned in all major tributaries, as well as the mainstems of the Sacramento and San Joaquin Rivers. The historical distribution of Central Valley late fall–run Chinook salmon is not well understood but is thought to be less extensive than that of fall-run. Late fall–run adults most likely spawned in the upper Sacramento and McCloud Rivers in reaches now blocked by Shasta Dam, as well as in major tributaries with adequate cold water in summer. There is also some evidence that they once spawned in the San Joaquin River in the Friant region and in other large San Joaquin tributaries (Yoshiyama et al. 1998).

The abundance of Central Valley fall- and late fall–run Chinook salmon escapement before 1952 is poorly documented. Reynolds et al. (1993) estimated that production of fall- and late fall–run Chinook salmon on the San Joaquin River historically approached 300,000 adults and probably averaged approximately 150,000 adults. Calkins et al. (1940) estimated fall- and late fall–run Chinook salmon abundance at 55,595 adults in the Sacramento River basin from 1931 to 1939. In the early 1960s, adult fall- and late fall–run Chinook salmon escapement was estimated to be 327,000 in the Sacramento River basin (California Department of Fish and Game 1965). In the mid-1960s, fall- and late fall–run Chinook salmon escapement to the San Joaquin River basin was estimated to be about 2,400 fish (Reynolds et al. 1993).

Long-term trends in adult fall-run Chinook salmon escapement since 1953 indicate that abundance in the Sacramento River has been consistently higher than abundance in the San Joaquin River. Annual escapement on the Sacramento River has been characterized by relatively high variability, ranging from approximately 100,000 to over 800,000 fish. Sacramento River escapement showed a marked increase in abundance between 1990 and 2003, followed by a decline in abundance from 2004 to the present. In 2009, adult fall-run Chinook salmon returns to Central Valley rivers showed a substantial decline in both the Sacramento and San Joaquin River systems (CalFish 2010). Similar declines in adult escapement also were observed for coho salmon and Chinook salmon returning to other river systems in California (MacFarlane et al. 2008). Trends in adult fall-run Chinook salmon escapement in the San Joaquin River tributaries have been relatively low since the 1950s, ranging from several hundred adults to approximately 100,000 adults (Reynolds et al. 1993).

Adult escapement estimates for late fall–run Chinook salmon returning to the Sacramento River from 1971 through 2009 have ranged from several hundred adults to over 40,000 adults. Adult escapement showed a general trend of declining abundance between 1971 and 1997. During the late 1990s and continuing through 2006, escapement increased substantially but was characterized by high interannual variability. The 2008 and 2009 escapement estimates were lower than the previous 4 years but were not characterized by the severe decline observed for fall-run Chinook salmon (CalFish 2010).

4.6.1.2 Life History

Adult fall-run Chinook salmon migrate through the Delta and into Central Valley rivers from June through December and spawn from September through December. Peak spawning activity usually occurs in October and November. The life history characteristics of late fall–run Chinook salmon are not well understood. Adult late fall–run Chinook salmon migrate through the Delta and into the Sacramento River from October through April and may wait for 1 to 3 months before spawning from December through April. Peak spawning activity occurs in February and

March. Chinook salmon typically mature between 2 and 6 years of age (Myers et al. 1998). The majority of Central Valley fall-run Chinook salmon spawn at age 3 (Moyle 2002).

Chinook salmon spawn in clean, loose gravel in swift, relatively shallow riffles, or along the margins of deeper river reaches where water temperatures, depths, and velocities are suitable for redd construction and egg incubation. Egg incubation for Central Valley fall-run Chinook salmon begins with spawning in September and can extend into March (Vogel and Marine 1991). Egg incubation for late fall–run Chinook salmon occurs from December through June (Vogel and Marine 1991; Earley et al. 2010).

Central Valley fall-run Chinook salmon fry (i.e., juveniles shorter than 2 inches long) generally emerge from December through March, with peak emergence occurring by the end of January. In general, fall-run Chinook salmon fry abundance in the Delta increases following high winter flows. Most fall-run Chinook salmon fry rear in fresh water from December through June, with smolt emigration occurring primarily from April through June. Smolts that arrive in the estuary after rearing upstream migrate quickly through the Delta and Suisun and San Pablo Bays. A very small number (generally less than 5%) of fall-run juveniles spend over a year in fresh water and emigrate as yearling smolts the following November through April. Central Valley late fall–run Chinook salmon fry generally emerge from April through June. Late fall fry rear in fresh water from April through the following April and emigrate as smolts from October through February (Snider and Titus 2000).

Upon emergence from the gravel, fry swim or are displaced downstream (Healey 1991). Fry seek nearshore habitats providing shallow water; vegetation; and substrates that provide aquatic and terrestrial invertebrates, cover and shelter from predators, and slower water velocities for resting (National Marine Fisheries Service 1996). These shallow-water habitats are considered to be more productive rearing habitat than the deeper main river channels. Higher juvenile salmon growth rates associated with greater prey consumption rates and favorable water temperatures have been observed on floodplains with extensive shallow-water habitats (Sommer et al. 2001).

4.6.1.3 Factors Affecting Abundance

Factors that contributed to the decline of Central Valley fall-/late fall–run Chinook salmon are similar to those described earlier for Sacramento River winter-run Chinook salmon and Central Valley spring-run Chinook salmon. Access to much or all of their historical spawning habitat was eliminated by dams, although fall-run Chinook salmon were less affected by these barriers because much of their historical spawning habitat included the lower gradient reaches downstream of these dams (Reynolds et al. 1993; McEwan 2001). However, changes in the seasonal hydrologic patterns resulting from water diversions and operation of upstream

reservoirs for water supply, flood control, and hydroelectric power generation have altered flows, water temperatures, and other habitat conditions for fall-run Chinook salmon and other species in these reaches (Williams 2006).

Properly functioning migration corridors for juvenile Central Valley fall- and late fall–run Chinook salmon consist of a wide range of habitat types, including primary and secondary channels, streambanks, floodplains, and marshes. Much of the Sacramento and San Joaquin River corridor and Delta have been leveed, channelized, and modified with rip-rap for flood risk reduction, thereby reducing and degrading the value and availability of natural habitat for rearing and emigrating juvenile Chinook salmon (Brandes and McLain 2001). Modification of natural flow regimes from upstream reservoir operations has resulted in dampening of the hydrograph, reducing the extent and duration of seasonal floodplain inundation and other flow-dependent habitat used by migrating juvenile Chinook salmon (70 FR 52488; Sommer et al. 2001; California Department of Water Resources 2005). Tidal and floodplain habitat areas provide important rearing habitat for foraging juvenile salmonids, including Central Valley fall-run Chinook salmon. Studies have shown that these salmonids may spend from 2 to 3 months rearing in these habitat areas, and losses resulting from land reclamation and levee construction are considered to be major stressors on juvenile salmonids (Williams 2009). Similarly, channel margins provide valuable rearing and connectivity habitat along migration corridors, particularly for smaller juvenile fry, such as fall-run Chinook salmon.

Predation on juvenile salmon by non-native fish has been identified as an important threat to fall- and late fall–run Chinook salmon in areas with high densities of non-native fish that prey on out-migrating juvenile salmon (e.g., smallmouth and largemouth bass, striped bass, and catfish) (Lindley and Mohr 2003). The low spatial complexity and reduced habitat diversity (e.g., lack of cover) of channelized waterways in the rivers and Delta reduce refuge space for salmon from predators (Raleigh et al. 1984; Missildine et al. 2001; 70 FR 52488).

Other factors that have contributed to the current status of Central Valley fall-run and late fall–run Chinook salmon and currently affect their abundance include harvest, artificial propagation programs (ecological and genetic effects), entrainment, and contaminants (Moyle 2002).

4.6.1.4 Survey Results

Focused surveys for Central Valley fall and late fall–run Chinook salmon were not conducted. However, it is well documented that fall and late fall–run Chinook salmon use the action area as a migration corridor during upstream (adult) and downstream (juvenile) migration. In addition, Central Valley fall and late fall–run Chinook salmon seasonally use the lower reaches of the

Sacramento River for rearing while emigrating to the ocean. Spawning and egg incubation do not occur in the action area (Moyle 2002).

The temporal occurrence and relative abundance of juvenile fall and late fall–run Chinook salmon in the action area can be inferred based on the weekly trawl surveys of the Sacramento River at Sherwood Harbor (RM 55) as part of the DJFMP (U.S. Fish and Wildlife Service 2015a). From January 2005 through March 2015, fall-run size juvenile Chinook salmon were detected in the trawls from December through August, although most were detected in the trawls from January through May (Table 4-10).

Table 4-10. Number of Fall-Run Size Juvenile Chinook Salmon Captured by Trawl at Sherwood Harbor (RM 55) by Month (January 2005 through March 2015)

Month/ Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Monthly Total[a]
Jan	220	218	4	493	1	80	64	558	435		1	2,073
Feb	498	328	2,021	688	414	139	84	156	78	15,471	196	19,877
Mar	789	473	143	5	82	39	88	370	5	6,543	1	8,537
Apr	1,409	278	1,038	62	274	399	746	624	826	969		6,625
May	2,388	2,598	950	409	981	47	407	358	548	92		8,778
Jun	48	110	17	12	25	6	117	13	16	1		365
Jul	8	33	54	1	6	4	3	2	1			112
Aug	1	4	3	1	1			3	1			14
Sep												0
Oct												0
Nov												0
Dec	67	1				225		67		103		463
Annual Total	**5,428**	**4,043**	**4,230**	**1,671**	**1,784**	**939**	**1,509**	**2,151**	**1,910**	**23,179**	**NA**	**46,844**

[a] 2015 data excluded from totals.
NA = Not applicable

By contrast, late fall–run size juvenile Chinook salmon were detected in the trawls in every season; they were not detected in the trawls in February, March, and June during this period (Table 4-11).

Table 4-11. Number of Late Fall–Run Size Juvenile Chinook Salmon Captured by Trawl at Sherwood Harbor (RM 55) by Month (January 2005 through March 2015)

Month/ Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Monthly Total[a]
Jan	1		1	1								3
Feb												0
Mar												0
Apr		1	1					1				3
May	8											8
Jun												0
Jul		1	11									12
Aug	1	2			1			1				5
Sep		1				1						2
Oct						1						1
Nov				1	1			5				7
Dec	1	1		1	1			5		5		14
Annual Total	**11**	**6**	**13**	**3**	**3**	**2**	**0**	**12**	**0**	**5**	**NA**	**55**

[a] 2015 data excluded from totals.
NA = Not applicable

4.6.1.5 Project Impacts

Effects on EFH for Pacific salmon would be similar to the impacts on species and critical habitat effects described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section.

The following environmental conditions potentially affect Pacific salmon EFH.

- Disturbance and direct injury.
- Increased exposure to contaminants
- Sedimentation and turbidity.
- Hazardous materials and contaminants.
- Temporary and permanent loss of aquatic habitat.
- Temporary and permanent loss of SRA cover habitat.
- Permanent increase in overwater structure

Effects to Pacific salmon EFH associated with sedimentation and turbidity, hazardous materials and contaminants, disturbance and direct injury, and habitat loss would be temporary. Potential adverse effects to EFH of increased fine sediment and turbidity will be avoided or minimized through implementation of all applicable BMPs. The potential environmental effects of the project would be limited to short-term, localized, and minor increases in turbidity and suspended sediment. Implementation of the SWPPP along with applicable BMPs would substantially reduce

or eliminate the potential for an accidental spill and unintentional discharge of contaminants with potential associated effects to EFH. Potential injury and mortality to fish associated with pile driving will be avoided or minimized by the following.

- Limiting the number and size of piles to the minimum necessary to meet the engineering and design requirements of the project.
- Using vibratory hammers first to drive piles to the maximum depth possible before driving piles with an impact hammer.
- Using the smallest pile driver and minimum force necessary to complete the work.
- Using a bubble ring or similar device to minimize the magnitude and extent of potentially harmful underwater noise levels while driving piles with an impact hammer.
- Conducting pile driving during daylight hours only.
- Limiting in-water construction to the proposed in-water construction window (May 1–November 30).

Long-term and permanent effects on EFH would include the net loss of aquatic habitat (substrate, water column) associated with the new bridge piers and RSP (Table 4-6), and permanent loss of up to 1.44 acre and temporary loss of up to 1.52 acre of cottonwood riparian forest habitat, of which approximately 0.44 acre is below the OHWM and contributes to overhead (shade) and instream SRA cover habitat. However, implementation of proposed compensation measures for project effects on perennial stream, critical habitat, and cottonwood riparian forest habitat (including SRA cover habitat), as discussed above for Sacramento River winter-run Chinook salmon, will also compensate for project effects on EFH for Pacific salmon.

Chapter 5 Conclusions and Determinations

5.1 Conclusions

5.1.1 Effects on Listed Fish Species

Direct adverse effects of the proposed project on listed fish species are expected to occur largely from underwater noise levels generated by the proposed pile driving activities that are predicted to reach levels that can cause harassment, injury, and mortality of fish, depending on a number of factors that influence exposure levels of fish to pile driving noise. Turbidity and suspended sediment levels during in-water construction activities (cofferdam installation and removal, pile driving, in-water placement of RSP) are expected to reach levels that can cause harassment of fish, potentially resulting in behavioral responses that could disrupt migration and foraging activities. In addition, cofferdam construction and dewatering, and the in-water placement of RSP can cause injury and mortality of fish that become entrapped in cofferdams or come in direct contact with RSP as it is being installed. Temporary construction lighting could alter the behavior and movements of delta smelt or attract predators to work areas, leading to increased predation. Direct effects on listed fish may also result from the permanent and temporary loss of aquatic (substrate and water column) habitat associated with the new bridge piers and temporary piles, respectively, and from the permanent loss of SRA cover habitat associated with construction of the new bridge. Indirect adverse effects on listed fish species may occur from the degradation of existing riverine habitat from increased overwater structure (artificial shade) and increased nighttime light intensity from permanent bridge lighting that may make predators more success at preying on juveniles of listed species.

The project proponents propose to implement a number of measures to avoid or minimize potential adverse effects on listed fish species. All in-water construction activities will be conducted between May 1 and November 30 to avoid and minimize construction effects on green sturgeon and the primary Chinook salmon and steelhead migration seasons. Increased turbidity and suspended sediment would be limited to temporary, localized plumes of sediment during installation and removal of temporary trestle and sheet piles, during the installation of permanent 108-inch-diameter piles for piers 3 and 4 and the permanent piles for the bridge fender system, and during in-water placement of RSP. Because of the potential presence of listed species during proposed pile driving activities, the project proponents propose to implement a number of measures to minimize harassment and the risk of injury or mortality from elevated underwater sounds levels. Potential harassment, injury, and mortality of fish from pile driving noise will be minimized by completing all pile driving activities within the proposed construction work

window, using vibratory drivers to drive piles to the maximum possible depth , using a bubble ring or similar device to attenuate impact pile driving sounds to the maximum extent feasible, driving of piles for piers 2 and 5 in dewatered cofferdams, using a vibratory hammer and/or hydraulic driven oscillator/rotator system to install the 108-inch-diameter steel casings for piers 3 and 4, conducting pile driving during daylight hours only to provide a harassment-free period each day, and avoiding removing and re-installing the piles for the temporary trestles between the first and second construction seasons. To ensure that underwater sound levels do not exceed predicted values, the project proponents will develop and implement a NMFS-approved hydroacoustic monitoring plan to monitor underwater noise levels during impact pile driving activities (Table 4-4).

5.1.2 Effects on Critical Habitat

Project effects on critical habitat of Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, and North American green sturgeon include temporary effects on water quality (underwater noise and increased turbidity and suspended sediment), temporary effects on water column habitat and channel substrate (i.e., from temporary trestle pile and cofferdam installation and removal), and permanent losses of aquatic and SRA cover habitat in the Sacramento River from installation of new bridge piers and RSP. Because of the temporary nature of construction activities and the proposed compensation for permanent effects of the project on habitat structure and function, no long-term effects on the PCEs or conservation value of critical habitat for these species in the region would be expected.

5.1.3 Effects on Essential Fish Habitat

Project effects on EFH would be similar to the critical habitat effects discussed above. Adverse effects would be limited to minor, temporary reductions in the availability of EFH associated with increased turbidity, sedimentation, underwater noise, and temporary and permanent losses in water column habitat, natural substrates, and cottonwood riparian forest habitat (including SRA cover habitat).

5.2 Determination

In conclusion, the project is likely to adversely affect Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, North American green sturgeon, and designated critical habitat for all four species. The primary effect of the project would be temporary delays in migration or cessation of foraging activity in response to increased turbidity, suspended sediment, and underwater noise. Any behavioral effects would be temporary and are not expected to measurably affect growth, survival, or reproductive success.

During impact pile driving, some fish may encounter potentially harmful noise levels—leading to harassment, injury, or mortality of individuals—but the majority of the adult and juvenile population in the Sacramento River during construction would not be affected based on the proposed timing and frequency of pile driving and the migration timing of these species and life stages in the action area. Project effects on critical habitat include temporary effects on water quality (increased turbidity and suspended sediment), rearing and movement habitat (noise and shade), water column habitat and channel substrate (pile installation and removal), and permanent losses of aquatic and SRA cover habitat in the Sacramento River (new permanent bridge piers and RSP). Compensation is proposed for the permanent loss of critical habitat.

Chapter 6 References

6.1 Printed References

Adams, P. B., C. B. Grimes, J. E. Hightower, S. T. Lindley, and M. L. Moser. 2002. *Status review for North American green sturgeon, Acipenser medirostris*. National Marine Fisheries Service, Santa Cruz, California.

Allen, P. J., B. Hodge, I. Werner, and J. J. Cech Jr. 2006. Effects of ontogeny, season, and temperature on the swimming performance of juvenile green sturgeon (*Acipenser medirostris*). *Canadian Journal of Fisheries and Aquatic Sciences* 63:1360-1369.

Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken (eds.). 2012. The Jepson Manual: Vascular Plants of California, second edition, revised. Berkeley: University of California Press.

Beamesderfer, R. C. P., G. Kopp, and D. Demko. 2005. Review of the Distribution, Life History and Population Dynamics of Green Sturgeon with Reference to California's Central Valley. S.P. Cramer and Associates, Inc. Gresham, OR and Oakdale, CA.

Behnke, R. J. 1992. *Native trout of western North America*. American Fisheries Society, Bethesda, Maryland.

Bisson, P. B. and R. E Bilby. 1982. Avoidance of suspended sediment by juvenile coho salmon. North American Journal of Fisheries Management. 2: 371-374.

Brandes and McLain. 2001. Juvenile Chinook salmon abundance, distribution, and survival in the Sacramento–San Joaquin Estuary. Contributions to the Biology of Central Valley Salmonids. R. L. Brown editor. California Department of Fish and Game. *Fish Bulletin* 179. Vol. 2:39–138.

CalFish. 2010. GrandTab. *Anadromous Resources Assessment* data report. March 9. Available: <http://www.calfish.org/Programs/ProgramIndex/CDFWAnadromousResourcesAssessment/tabid/213/Default.aspx>.

_____. 2011. Grand Tab. *Anadromous Resources Assessment* data report. February 1. Available: <http://www.calfish.org/Programs/ProgramIndex/CDFWAnadromousResourcesAssessment/tabid/213/Default.aspx>.

_____. 2012. GrandTab. *Anadromous Resources Assessment* data report. April 23. Available: <http://www.calfish.org/Programs/ProgramIndex/CDFWAnadromousResourcesAssessment/tabid/213/Default.aspx>.

California Department of Fish and Game. 1965. *California Fish and Wildlife Plan*. Volumes 1–3. Inland Fisheries Division, Sacramento, CA.

_____. 1987. *Delta outflow effects on the abundance and distribution of San Francisco Bay fish and invertebrates, 1980–1985*. Exhibit 60, Proceedings of the State Water Resources Control Board 1987 water quality/water rights hearings on the San Francisco Bay/Sacramento–San Joaquin Delta.

_____. 1998. Report to the Fish and Game Commission. A Status Review of the Spring-Run Chinook salmon (*Oncorhynchus tshawytscha*) in the Sacramento River Drainage. Candidate species status report 98-01.

_____. 2002. *California Department of Fish and Game comments to NMFS regarding green sturgeon listing*. Sacramento.

_____. 2006. *Emergency sturgeon on regulations will take effect on Monday, March 20*. California Department of Fish and Game News Release. March 17. Available: <http://www.dfg.ca.gov/news/news06/06030.html>.

_____. 2008. *California Aquatic Invasive Species Management Plan*. January 2008. Available: <http://www.dfg.ca.gov/invasives/plan/>. Accessed: February 11, 2014.

California Department of Transportation. 2009. Final: technical guidance for assessment and mitigation of the hydroacoustic effects of pile driving on fish. February. Prepared by ICF Jones & Stokes and Illingworth and Rodkin, Inc. Sacramento, CA.

California Department of Water Resources. 2004. SP-T3/5 Project effects on riparian resources, wetlands, and associated floodplains. Draft final report. Oroville Facilities Relicensing FERC Project No. 2100. Available: <http://www.water.ca.gov/orovillerelicensing/>. Accessed May 5, 2014.

_____. 2005. *Fish Passage Improvement*. Bulletin 250. June 2005. Available: <http://www.water.ca.gov/fishpassage/docs/b250/B250_frontpages.pdf>.

_____. 2012b. Urban Levee Design Criteria. May 2012. Available: http://www.water.ca.gov/floodsafe/leveedesign/ULDC_May2012.pdf. Accessed: February 16, 2015.

Calkins, R. D., W. F. Durand, and W. H. Rich. 1940. *Report of the board of consultants on the fish problem of the upper Sacramento River*. Stanford University, Stanford, CA.

Carlson, T. J., M. Hastings, and A. N. Popper. 2007. Update on recommendations for revised interim sound exposure criteria for fish during pile driving activities. Memorandum to Suzanne Theiss (California Department of Transportation) and Paul Wagner (Washington Department of Transportation).

Carrasquero, J. 2001. *Overwater Structures: Freshwater Issues*. Seattle, WA: Herrera Environmental Consultants, for Washington Department of Fish and Wildlife, Washington Department of Ecology, Washington Department of Transportation.

Cavallo, B., R. Brown, and D. Lee. 2009. Hatchery and genetic management plan for Feather River Hatchery spring-run Chinook salmon program. Prepared for California Department of Water Resources. June 2009.

Cech, J. J., S. I. Doroshov, G. P. Moberg, B. P. May, R. G. Schaffter, and D. M. Kohlhorst. 2000. Biological Assessment of Green Sturgeon in the Sacramento–San Joaquin Watershed (Phase 1). Final report to CALFED Bay-Delta Program. Project # 98-C-15.

Central Valley Regional Water Quality Control Board. 2011. *The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region.* Fourth Edition, Revised October 2011 (with approved amendments). Available: <www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr.pdf>.

Colway, C., and Stevenson, D. E. 2007. Confirmed Records of Two Green Sturgeon from the Bering Sea and Gulf of Alaska. Northwestern Naturalist 88:188–192.

Cramer, S. P. and D. B. Demko. 1997. *The status of late-fall and spring Chinook salmon in the Sacramento River basin regarding the Endangered Species Act*. Special Report. Submitted to National Marine Fisheries Service on behalf of Association of California Water Agencies and California Urban Water Agencies. Prepared by S. P. Cramer and Associates, Inc., Gresham, Oregon.

Deng, X., J. P. Van Eenennaam, and S. I. Doroshov. 2002. Comparison of early life stages and growth of green and white sturgeon. *Transactions of the American Fisheries Society* 28:237–248.

Earley, J. T., D. J. Colby, and M. R. Brown. 2010. *Juvenile Salmonid Monitoring in Clear Creek, CA, from October 2008 through September 2009*. U.S. Fish and Wildlife Service, Red Bluff, CA.

Fisher, F. 1994. Past and present status of Central Valley Chinook salmon. *Conservation Biology* 8(3):870-873.

GEI Consultants, Inc. 2014. Preliminary Geotechnical and Foundation Report, I Street Bridge Replacement, Sacramento, California. Prepared for Mark Thomas and Company. Sacramento, CA.

Hallock, R. J. 1987. *Sacramento River system salmon and steelhead problems and enhancement opportunities*. A report to the California Advisory Committee on Salmon and Steelhead Trout.

_____. 1989. *Upper Sacramento River Steelhead*, Oncorhynchus mykiss, *1952–1988.* Report to the U.S. Fish and Wildlife Service, September 15.

Hallock, R. J., and F. W. Fisher. 1985. *Status of the winter-run Chinook salmon,* Oncorhynchus tshawytscha*, in the Sacramento River*. Office Report. California Department of Fish and Game, Anadromous Fisheries Branch, Sacramento.

Healey, M. C. 1991. Life history of Chinook salmon (*Oncorhynchus tshawytscha*). pp. 311–393. In C. Groot and L. Margolis, *Pacific Salmon life histories*. Vancouver, British Columbia: UBC Press. 564 pp.

Hill, K. A., and J. D. Webber. 1999. *Butte Creek spring-run Chinook salmon,* Oncorhynchus tshawytscha*, juvenile outmigration and life history 1995-1998*. Inland Fisheries Administrative Report No. 99-5. California Department of Fish and Game, Sacramento Valley and Central Sierra Region, Rancho Cordova.

ICF Jones and Stokes and Illingworth and Rodkin Inc. 2009. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish—Final. Prepared for California Department of Transportation: 298.

ICF. 2015. Water Quality Assessment Report, I Street Bridge Replacement Project. Prepared for California Department of Transportation. August

Kynard, B., E. Parker, and T. Parker. 2005. Behavior of early life intervals of Klamath River green sturgeon, Acipenser medirostris, with note on body color. *Environmental Biology of Fishes* 72:85-97.

Lindley, S. T., R. S. Schick, E. Mora, P. B. Adams, J. J. Anderson, S. Greene, C. Hanson, B. P. May, D. R. McEwan, R. B. MacFarlane, C. Swanson, and J. G. Williams. 2007. Framework for Assessing Viability of Threatened and Endangered Chinook Salmon and Steelhead in the Sacramento-San Joaquin Basin. *San Francisco Estuary and Watershed Science* 5(1). February 2007. Article 4. Available: <http://escholarship.org/uc/item/3653x9xc>.

Lindley, S. T., and M. S. Mohr. 2003. Modeling the effect of striped bass (Morone saxatillis) on the population viability of Sacramento River winter-run Chinook salmon (Oncorhynchus tshawytscha). *Fisheries Bulletin* 101:321–331.

Lloyd, D. S., J. P. Koenings, and J. D. La Perriere. 1987. Effects of turbidity in fresh waters of Alaska. *North American Journal of Fisheries Management*.

MacFarlane, R. B., S. Hayes, and B. Wells. 2008. Coho and Chinook Salmon Decline in California during the Spawning Seasons of 2007/08. National Marine Fisheries Service. Southwest Region. Santa Cruz, California.

Mayfield, R. B. and J. J. Cech, Jr. 2004. Temperature Effects on green sturgeon bioenergetics. *Transactions of the American Fisheries Society* 133:961-970.

McEwan, D. R. 2001. Central Valley Steelhead. In: R. Brown (ed.). Contributions to the Biology of Central Valley Salmonids. California Department of Fish and Game Fish Bulletin No 179.

McEwan, D., and T. A. Jackson. 1996. *Steelhead restoration and management plan for California*. Management Report. California Department of Fish and Game, Inland Fisheries Division, Sacramento.

Meehan, W. R., and T. C. Bjornn. 1991. Salmonid distributions and life histories. Pages 47–82 in W. R. Meehan, editor. *Influences of forest and rangeland management on salmonid fishes and their habitats*. American Fisheries Society Special Publication No. 19. Bethesda, Maryland.

Mills, T. J., and F. Fisher. 1994. *Central Valley anadromous sport fish annual run-size, harvest, and population estimates, 1967 through 1991*. Inland Fisheries Technical Report. California Department of Fish and Game.

Missildine, B., R. Peters, R. Piaskowski, R. Tabor. 2001. *Habitat Complexity, Salmonid Use, and Predation of Salmonids at the Bioengineered Revetment at the Maplewood Golf Course on the Cedar River, Washington*. Miscellaneous report. U.S. Fish and Wildlife Service, Western Washington Office, Lacey, WA.

Moyle, P. 2002. Inland Fishes of California. Berkeley: University of California Press.

Moyle, P. B., R. M. Yoshiyama, J. E. Williams, and E. D. Wikramanayake. 1995. Fish Species of Special Concern in California. Second Edition. Prepared for California Department of Fish and Game, Rancho Cordova. Contract No. 2128IF.

Myers, J. M., R. G. Kope, B. J. Bryant, D. Teel, L. J. Lierheimer, T. C. Wainwright, W. S. Grant, F. W. Waknitz, K. Neely, S. T. Lindley, and R. S. Waples. 1998. *Status review of Chinook salmon from Washington, Idaho, Oregon, and California*. U.S. Dep. Commer., NOAA Tech. Memo NMFS-NWFSC-35, 443 p.

Nakamoto, R. J., T. T. Kisanuki, and G. H. Goldsmith. 1995. Age and growth of Klamath River green sturgeon (*Acipenser medistrostris*). Funded by U.S, Fish and Wildlife Service, Klamath River Fishery Resource Office. Yreka, CA. Project 93-FP-13.

National Marine Fisheries Service. 1993. Biological opinion addressing the potential effects on Sacramento River winter-run Chinook salmon from the operation of the Central Valley Project during 1992. National Marine Fisheries Service, Southwest Region.

_____. 1996. *Factors for decline: a supplement to the notice of determination for West Coast steelhead under the Endangered Species Act*. National Marine Fisheries Service, Protected Species Branch, Portland, Oregon and National Marine Fisheries Service, Protected Species Management Division, Long Beach, California.

_____. 1998. Endangered and Threatened Species: Threatened Status for Two ESUs of Steelhead in Washington, Oregon, and California. *Federal Register* 63:13347.

_____. 1999. Endangered and threatened species; threatened status for two Chinook salmon evolutionarily significant units (ESUs) in California. *Federal Register* 64: 50394-50415.

_____. 2000. Designated critical habitat: critical habitat for 19 evolutionarily significant units of salmon and steelhead in Washington, Oregon, Idaho, and California. *Federal Register* 65: 7764–7787.

_____. 2001. Biological opinion for Sacramento River Bank Protection Project. Contract 42E: proposed levee reconstruction at river mile 149.0, Colusa County, California and five sites along the mainstem Sacramento River. Sacramento, California.

_____. 2003. Endangered and threatened wildlife and plants: 12-month finding on a petition to list North American green sturgeon as a threatened or endangered species. *Federal Register* 68: 4433–4441.

_____. 2005a. Endangered and threatened species; final listing determinations for 16 ESUs of West Coast salmon, and final 4(d) protective regulations for threatened salmonid ESUs. *Federal Register* 70: 37160–37204.

_____. 2005b. Endangered and threatened species; designation of critical habitat for 12 Evolutionarily Significant Units of west coast salmon and steelhead in Washington, Oregon, and Idaho. *Federal Register* 70: 52630–52858.

_____. 2005c. Endangered and threatened wildlife and plants: proposed threatened status for Southern Distinct Population Segment of North American green sturgeon. *Federal Register* 70: 17386–17401.

_____. 2005d. *Green sturgeon (*Acipenser medirostris*) status review update*. NOAA Fisheries, Southwest Fisheries Science Center, Long Beach, California.

_____. 2006a. *Biological opinion for the Sacramento River Bank Protection Project, 14 critical levee erosion repairs*. Prepared for the U.S. Army Corps of Engineers, Sacramento District, California.

_____. 2006b. Endangered and threatened wildlife and plants: threatened status for southern distinct population segment of North American green sturgeon: final rule. *Federal Register* 71: 17757–17766.

_____. 2009a. Biological Opinion for the Dumbarton Bridge Seismic Retrofit Project. Southwest Region, Long Beach, CA. 2009/02486.

_____. 2009b. Public Draft Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook

Salmon and the Distinct Population Segment of Central Valley Steelhead. Sacramento Protected Resources Division. October.

_____. 2010. *Federal Recovery Outline, North American Green Sturgeon Southern Distinct Population Segment*. Prepared by National Marine Fisheries Service, Southwest Region. Available: <http://swr.nmfs.noaa.gov/gs/jd/Green_Sturgeon_sDPS_Recovery_Outline.pdf>.

National Marine Fisheries Service. 2014. Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the Distinct Population Segment of California Central Valley Steelhead. July. California Central Valley Area Office. Sacramento, CA.

Natural Resources Conservation Service. 2014a. United States Department of Agriculture, Soil Survey Staff. Web Soil Survey. Available: http://websoilsurvey.nrcs.usda.gov/. Accessed April 7, 2015. Last updated: September 20, 2014 (Sacramento County) and September 25, 2014 (Yolo County).

Pacific Fishery Management Council. 2002. *Review of 2001 ocean salmon fisheries*. Pacific Fishery Management Council, Portland, Oregon.

Popper, A. N. and M. C. Hastings. 2009. The effects of human-generated sound on fish. Integrative Zoology 4:43-52.

Popper, A. N., T. J. Carlson, A. D. Hawkins, B. L. Southall, and R. L. Gentry. 2006. Interim criteria for injury of fish exposed to pile driving operations: A white paper.

Raleigh, R. F., T. Hickman, R. C. Soloman, and P. C. Nelson. 1984. Habitat suitability information: rainbow trout. (Biological Report 82[10.60].) U.S. Fish and Wildlife Service. Washington DC.

Reynolds, F. L., T. Mills, R. Benthin, and A. Low. 1993. Central Valley anadromous fisheries and associated riparian and wetlands areas protection and restoration action plan. Draft. California Department of Fish and Game, Inland Fisheries Division. Sacramento, CA.

S. P. Cramer and Associates. 1995. *Central Valley Project Improvement Act anadromous fish restoration program doubling plan-recommended actions for the Mokelumne River*. Gresham, Oregon.

Sigler, J. W., T. C. Bjornn, and F. H. Everest. 1984. Effects of chronic turbidity on densities and growth of steelheads and coho salmon. Transactions of the American Fisheries Society 113: 142-150.

Slater, D. W. 1963. *Winter-run Chinook salmon in the Sacramento River, California with notes on water temperature requirements at spawning*. Special Scientific Report—Fisheries 461. U.S. Fish and Wildlife Service.

Snider, B. and R. G. Titus. 2000. *Timing, composition, and abundance of juvenile anadromous salmonid emigration in the Sacramento River near Knights Landing, October 1996-September 1997*. California Department of Fish and Game, Habitat Conservation Division, Stream Evaluation Program Technical Report No. 00-04.

Sommer, T. R., M. L. Nobriga, W. C. Harrell, W. Batham, and W. J. Kimmerer. 2001. Floodplain rearing of juvenile Chinook salmon: evidence of enhanced growth and survival. *Canadian Journal of Fisheries and Aquatic Sciences* 58: 325–333.

State Water Resources Control Board (SWRCB). 2011. 2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report) — Statewide. Available: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml. Accessed: April 10, 2015.Stebbins, R. C. 2003. Western reptiles and amphibians, Third Edition. New York, NY: Houghton Mifflin Company.

Sweeney, B. W., T. L. Bott, J. K. Jackson, L. A. Kaplan, J. D. Newbold, L. J. Standley, W. C. Hession, and R. J. Horwitz. 2004. Riparian Deforestation, Stream Narrowing, and Loss of Stream Ecosystem Services. National Academy of Sciences 101:14132–14137.

Tabor, R. A., G. S. Brown, and V. T. Luiting. 2001. The Effect of Light Intensity on Sockeye Salmon Fry Migratory Behavior and Predation by Cottids in the Cedar River, Washington. North American Journal of Fisheries Management 24: 128–145.

Tuvikene, A. 1995. Responses of Fish to Polycyclic Aromatic Hydrocarbons (PAHs). *Annales Zoologici Fennici* 32:295–309.

U.S. Army Corps of Engineers. 2000. *Biological assessment for the Sacramento River bank protection project; 42E, proposed levee reconstruction at river mile 149.0, Colusa County, California and at five other sites along the mainstem Sacramento River*. U.S. Army Corps of Engineers, Sacramento, California.

_____. 2014. Engineering Technical Letter 1110-2-583. *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures*. April 30, 2014. Washington, DC. Available: <http://www.publications.usace.army.mil/Portals/76/Publications/EngineerTechnicalLetters/ETL_1110-2-583.pdf>. Accessed: August 28, 2014.

U.S. Department of the Interior, Bureau of Reclamation. 1986. *Central Valley fish and wildlife management study*. Temperature and flow studies for optimizing Chinook salmon production, upper Sacramento River, California. Special report. Sacramento, California.

U.S. Environmental Protection Agency. 2015. Surf Your Watershed, Lower Sacramento Watershed--18020109. Available: http://cfpub.epa.gov/surf/huc.cfm?huc_code=18020109. Last updated: 5-13-15. Accessed: 5-13-15.

U.S. Fish and Wildlife Service. 1992. Shaded Riverine Aquatic Cover of the Sacramento River System: Classification as a Resource Category 1 Under the FWS Mitigation Policy. October. Fish and Wildlife Enhancement, Sacramento Field Office, Sacramento, CA.

U.S. Fish and Wildlife Service. 1995. Draft anadromous fish restoration plan: a plan to increase natural production of anadromous fish in the Central Valley of California. Prepared for the Secretary of the Interior by the U.S. Fish and Wildlife Service with assistance from the Anadromous Fish Restoration Program Core Group under authority of the Central Valley Project Improvement Act.

———. 1996. Recovery plan for the Sacramento-San Joaquin Delta native fishes. Technical/Agency Draft. Prepared by Delta Native Fishes Recovery Team, U.S. Fish and Wildlife Service, Region 1, Portland, Oregon.

———. 2004. Impacts of riprapping to aquatic organisms and river functioning, lower Sacramento River, California. Sacramento, CA. June 2004.

———. 2015a. List of federal endangered and threatened species that occur in or may be affected by projects in the proposed project location. April 17, 2015.

———. 2015b. Delta juvenile fish monitoring program data. Available: <http://www.fws.gov/lodi/jfmp/>. Accessed: June 1, 2015.

U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998. Engangered species act consultation handbook: procedures for conducting Section 7 consultations and conferences. March. Washington, D.C.

Van Eenennaam, J. P., J. Linares-Casenave, X. Deng, and S. I. Doroshov. 2005. Effect of incubation temperature on green sturgeon embryos, Acipenser medirostris. *Environmental Biology of Fishes* 72:145-154.

Vogel, D. A. and K. R. Marine. 1991. *Guide to upper Sacramento River Chinook salmon life history*. Prepared by CH2M Hill, Redding, California for U.S. Bureau of Reclamation, Central Valley Project.

Wakeham, S. G., C. Schaffner, and W. Giger. 1980. Polycylic Aromatic Hydrocarbons in Recent Lake Sediments—I. Compounds Having Anthropogenic Origins. *Geochimica et Cosmochimica Acta*, 44 (3): 403–413.

Wang, J. C. S., and R. L. Brown. 1993. Observations of early life stages of Delta smelt, *Hypomesus transpacificus*, in the Sacramento–San Joaquin Estuary in 1991, with a review of its ecological status in 1988 to 1990. Technical Report 35. November.

Waters, T. F. 1995. Sediment in streams—sources, biological effects and control. American Fisheries Society Monograph 7. Bethesda, MD. 251 pp.

Western Regional Climate Center. 2005. Temperature and Precipitation Records for SACRAMENTO WSO CITY (047633), California, 1890–2005. Available: < http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?casacc+nca >. Accessed: January 15, 2016.

Williams, J. G. 2006. Central Valley salmon: a perspective on Chinook and steelhead in the Central Valley of California. *San Francisco Estuary and Watershed Science* 4(3): Article 2. Available at: <http://escholarship.org/uc/item/21v9x1t7#page-1>.

Williams, J. G. 2009. *Sacramento-San Joaquin Delta Regional Ecosystem Restoration Implementation Plan: Life-history Conceptual Model for Chinook Salmon and (*Oncorhynchus tshawytscha and O. mykiss*)*. Sacramento-San Joaquin Delta, Regional Ecosystem Restoration Implementation Plan.

Williams, T. H, S. T. Lindley, B. C. Spence, and D. A. Boughton. 2011. Status review update for Pacific salmon and steelhead listed under the endangered species act: Southwest. 20 May 2011 – Update to 5 January 2011 report. Available: <http://www.westcoast.fisheries.noaa.gov/publications/status_reviews/salmon_steelhead/swfsc_5_year_status_review_report_2011.pdf>.

Yoshiyama, R. M., F. W. Fisher, and P. B. Moyle. 1998. Historical abundance and decline of Chinook salmon in the Central Valley region of California. *North American Journal of Fisheries Management* 18: 487–521.

6.2 Personal Communications

Rea, Maria. Assistant Regional Administrator, National Marine Fisheries Service. August 20, 2015—Letter to Ms. Sue Bauer, California Department of Transportation, regarding request for technical assistance for Caltrans' proposed project to replace the I-Street Bridge over the Sacramento River.

Sommer, Ted. Biologist, California Department of Water Resources. July 24, 2002—Personal communication with A. J. Keith, Stillwater Sciences, Berkeley, California.

Appendix A Species List

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
650 Capitol Mall, Suite 5-100
Sacramento, California 95814-4700

AUG 2 9 2015

Ms. Sue Bauer
Chief, Environmental Management, M-1 Branch
Department of Transportation, District 3
703 B Street
Marysville, CA 95901

Re: Endangered Species Act (ESA) Section 7(a)(2) Species List for I Street Bridge Replacement Project

Dear Ms. Bauer:

This is in response to your July 22, 2015, letter requesting technical assistance from NOAA's National Marine Fisheries Service (NMFS) regarding the California Department of Transportation's (Caltrans) proposed project to replace the I Street Bridge over the Sacramento River between the cities of Sacramento and West Sacramento, approximately 1,000 feet north of the existing I Street Bridge, in Sacramento County, California. Waterways within the project area include the mainstem of the Sacramento River upstream of the Sacramento-San Joaquin Delta (Delta) and downstream of its confluence with the American River. Caltrans has requested NMFS to provide the species listed on the Federal List of Endangered and Threatened Wildlife (50 C.F.R. 70.11), or critical habitat designated that may occur within the project area.

Available information indicates that the following listed species and designated critical habitat could occur in the project area, or have the potential to be affected by the project (Table 1):

In addition, a comprehensive collection of species listing information, critical habitat designations, status reviews, distribution maps and Federal Register (FR) Notices for listed salmonids can be found on the NMFS West Coast Region website at: http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/salmon_and_steelhead_listings/salmon_and_steelhead_listings.html, and for green sturgeon at: http://www.westcoast.fisheries.noaa.gov/protected_species/green_sturgeon/green_sturgeon_pg.html.

Formal and informal consultation is initiated through a request that must include the following six pieces of information as described in CFR 402.14(c):

(1) A description of the proposed action to be covered;

(2) A description of the specific area that may be affected by the proposed action; Table 1—FR ESA listings for affected species and their critical habitat designations as applicable in or near the project area.

Species	ESU or DPS	Original Final FR Listing	Current Final Listing Status	Critical Habitat Designated
Chinook salmon (*Oncorhynchus tshawytscha*)	Central Valley (CV) spring-run ESU	9/16/1999 64 FR 50394 Threatened	6/28/2005 70 FR 37160 Threatened	9/2/2005 70 FR 52488
Chinook salmon (*O. tshawytscha*)	Sacramento River (SR) winter-run ESU	1/4/1994 59 FR 440 Endangered	6/28/2005 70 FR 37160 Endangered	6/16/1993 58 FR 33212
Steelhead (*O. mykiss*)	California Central Valley (CCV) DPS	3/19/1998 63 FR 13347 Threatened	1/5/2006 71 FR 834 Threatened	9/2/2005 70 FR 52488
North American (NA) Green sturgeon (*Acipenser medirostris*)	Southern DPS	4/7/2006 71 FR 17757 Threatened	4/7/2006 71 FR 17757 Threatened	10/9/2009 74 FR 52300

(3) A description of any listed species or critical habitat that may be affected by the proposed action;

(4) A description of the manner in which the action may affect any listed species or critical habitat, and an analysis of any direct, indirect, or cumulative effects.

a. Direct Effects: Effects to listed species of designated critical habitat that occur during implementation of the project.

b. Indirect Effects: Effects to listed species that occur later in time or offsite, but are reasonably certain to occur.

c. Cumulative Effects: For purposes of the ESA, cumulative effects are defined as the effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within an action area of the Federal action subject to consultation (50 CFR 402.02). Future Federal actions are not included here because they require separate consultation pursuant to Section 7 of the ESA;

(5) Relevant reports, including any environmental impact statements, environmental assessments, biological assessments or other analysis prepared regarding the proposal; and

(6) Any other relevant studies or other information available on the action, the affected listed species, or critical habitat.

The following is a description of critical habitat for SR winter-run Chinook salmon, CV spring-run Chinook salmon, and CCV steelhead in or near the project area:

Critical habitat includes the stream channels in the designated stream reaches and the lateral extent as defined by the ordinary high-waterline. In areas where the ordinary high-waterline has not been defined, the lateral extent will be defined by the bankfull elevation (defined as the level at which water begins to leave the channel and move into the floodplain; it is reached at a discharge that generally has a recurrence interval of 1 to 2 years on the annual flood series). Critical habitat for SR winter-run Chinook salmon, CV spring-run Chinook salmon, and CCV steelhead are defined as specific areas that contain the primary constituent elements (PCE) and physical habitat elements (PHE) essential to the conservation of the species. The following information discusses the inland habitat types used as PCEs for CV spring-run Chinook salmon and CCV steelhead and as PHEs for SR winter-run Chinook salmon that may occur along the Sacramento River mainstem near the project site.

PCEs for CV spring-run salmon and CCV steelhead and PHEs for SR winter-run Chinook salmon in the Sacramento River near the project site

Freshwater Rearing Habitat

Freshwater rearing sites are those with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large woody material, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks. Both spawning areas and migratory corridors comprise rearing habitat for juveniles, which feed and grow before and during their outmigration. Rearing habitat condition is strongly affected by habitat complexity, food supply, and the presence of predators of juvenile salmonids. The channelized, leveed, and riprapped river reaches and sloughs that are common in the Delta south of the project location have been significantly degraded by the placement of riprap. Freshwater rearing habitats are considered to have a high conservation value and recovery potential even if they are significantly degraded compared to their natural state.

Freshwater Migration Corridors

Ideal freshwater migration corridors are free of migratory obstructions, with water quantity and quality conditions that enhance migratory movements. They contain natural cover such as riparian canopy structure, submerged and overhanging large woody objects, aquatic vegetation, large rocks, and boulders, side channels, and undercut banks which augment juvenile and adult mobility, survival, and food supply. These corridors allow the upstream passage of adults, and the downstream emigration of outmigrant juveniles. The Sacramento River is a primary migration corridor for adult and juvenile salmon and steelhead. Freshwater migration corridors are considered to have a high conservation and recovery potential value even if they are significantly degraded compared to their natural state.

Estuarine Areas

Estuarine areas free of migratory obstructions with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh and salt water are included as a PCE. Natural cover such as submerged and overhanging large woody material, aquatic vegetation floodplains and side channels, are essential for juvenile and adult foraging. The project area is located along the Sacramento River mainstem just north of the Delta and may be a critical component of estuarine PCEs. Estuarine areas are considered to have a high conservation value as they provide factors which function to provide predator avoidance and as a transitional zone to the ocean environment. Estuarine areas are considered to have a high conservation and recovery potential value even if they are significantly degraded compared to their natural state.

The following is a description of critical habitat for the Southern DPS of NA green sturgeon in or near the project area:

Critical habitat for Southern DPS green sturgeon includes the stream channels and waterways in and near the Delta to the ordinary high waterline. There are several PCEs present that should be considered at the project location.

PCEs for the Southern DPS of NA green sturgeon in the Sacramento River near the project site

Food Resources

Abundant food items within estuarine habitats and substrates for juvenile, subadult, and adult life stages are required for the proper functioning of this PCE for green sturgeon. Prey species for juvenile, subadult, and adult green sturgeon within bays and estuaries primarily consist of benthic invertebrates and fish, including crangonid shrimp, callianassid shrimp, burrowing thalassinidean shrimp, amphipods, isopods, clams, annelid worms, crabs, sand lances, and anchovies. These prey species are critical for the rearing, foraging, growth, and development of juvenile, subadult, and adult green sturgeon within the bays and estuaries.

Water Flow

Within bays and estuaries adjacent to the Sacramento River (*i.e.*, the Delta and the Suisun, San Pablo, and San Francisco bays), sufficient flow into the bay and estuary to allow adults to successfully orient to the incoming flow and migrate upstream to spawning grounds is required. Sufficient flows are needed to attract adult green sturgeon into the Sacramento River from the bay and to initiate the upstream spawning migration into the upper river.

Water Quality

Adequate water quality, including temperature, salinity, oxygen content, and other chemical characteristics are necessary for normal behavior, growth, and viability of all life stages. Suitable water temperatures for juvenile green sturgeon should be below 24°C (75°F). At temperatures above 24°C, juvenile green sturgeon exhibit decreased swimming performance and increased cellular stress. Adequate levels of dissolved oxygen (DO) are also required to support

oxygen consumption by juveniles (ranging from 61.8 to 76.1 mg O_2 hr^{-1} kg^{-1}). Suitable water quality also includes water free of contaminants (*e.g.*, organochlorine pesticides, polyaromatic hydrocarbons (PAHs), or elevated levels of heavy metals) that may disrupt the normal development of juvenile life stages, or the growth, survival, or reproduction of subadult or adult stages.

Migratory Corridor

Safe and unobstructed migratory pathways are necessary for successful and timely passage of adult, sub-adult, and juvenile fish within the region's different estuarine habitats and between the upstream riverine habitat and the marine habitats. Within the waterways comprising the Delta, and bays downstream of the Sacramento River, safe and unobstructed passage is needed for juvenile green sturgeon during the rearing phase of their life cycle. Rearing fish need the ability to freely migrate from the river through the estuarine waterways of the Delta and bays and eventually out into the ocean. Passage within the bays and the Delta is also critical for adults and subadults for feeding and summer holding, as well as to access the Sacramento River for their upstream spawning migrations and to make their outmigration back into the ocean. Within bays and estuaries outside of the Delta and the areas comprised by Suisun, San Pablo, and San Francisco bays, safe and unobstructed passage is necessary for adult and subadult green sturgeon to access feeding areas, holding areas, and thermal refugia, and to ensure passage back out into the ocean.

Water Depth

A diversity of depths is necessary for shelter, foraging, and migration of juvenile, subadult, and adult life stages. Adults and subadults within the estuary primarily occupy waters over shallow depths of less than 10 meters, either swimming near the surface or foraging along the bottom. In a study of juvenile green sturgeon in the Delta, relatively large numbers of juveniles were captured primarily in shallow waters from 3 to 8 feet deep, indicating juveniles may require shallower depths for rearing and foraging. Thus, a diversity of depths is important to support different life stages and habitat uses for green sturgeon within estuarine areas.

Sediment Quality

Sediment quality (*i.e.*, chemical characteristics) is necessary for normal behavior, growth, and viability of all life stages. This includes sediments free of contaminants (*e.g.*, elevated levels of selenium, PAHs, and organochlorine pesticides) that can cause negative effects on all life stages of green sturgeon.

Essential Fish Habitat (EFH)

The proposed project site is within the region identified as EFH for Pacific salmon in Amendment 14 of the Pacific Salmon FMP. EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purposes of interpreting the definition of EFH, "waters" includes aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used

by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means habitat required to support a sustainable fishery and a healthy ecosystem; and, "spawning, breeding, feeding, or growth to maturity" covers all habitat types used by a species throughout its life cycle. In order to protect EFH, federal agencies are required to consult with NMFS on activities that may adversely affect EFH, and NMFS must provide EFH conservation recommendations to those agencies (section 305(b)(4)(A)).

Fall-run Chinook salmon have the potential to be present near the project location and are managed under the Pacific Coast Salmon Fisheries Management Plan (FMP). Habitat areas of particular concern (HAPCs), as designated under this FMP, include (1) complex channels and floodplain habitats, (2) thermal refugia, (3) spawning habitat, (4) estuaries, and (5) marine and estuarine submerged aquatic vegetation. Caltrans should identify and discuss HAPCs present, if any, along the Sacramento River mainstem near the project location.

ESA Section 7(a)(1) Conservation Recommendations

Section 7(a)(1) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C 1531 *et seq.*), directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. Conservation recommendations are discretionary agency activities intended to minimize or avoid adverse effects of a proposed project on listed species or critical habitat, to help implement recovery plans, or to develop information.

Bridge replacement projects have a high potential to further degrade habitat for anadromous fish and reduce their recovery potential. We recommend a pre-consultation meeting to discuss methods to minimize and avoid impacts of this project, including project timing. Some examples include:

(1) Re-vegetate onsite at a 3:1 ratio immediately following the completion of the proposed project for any area consisting of removed or disturbed vegetation with native riparian species in efforts to facilitate the development of shaded riverine aquatic (SRA) habitat. A detailed re-vegetation plan should be provided and should include a list of species and designs depicting the proposed location for each species and their density. The vegetation plan should also include proposed irrigation and vegetation monitoring schedules which will likely be needed for several years;

(2) Develop a monitoring plan to evaluate the success of the re-vegetation efforts which would indicate the overall performance of the planted vegetation at each site and include guidelines for replacing vegetation that fail to establish.

(3) Purchase rearing habitat credits at a 3:1 ratio for the placement of rock slope protection (RSP), if used, within the action area at a NMFS approved anadromous fish conservation bank;

(4) Implement best management practices, including Storm Water Pollution Prevention Program and Water Pollution Control Program, to minimize effects to federally listed fish and their designated critical habitat;

(5) Use a soil-rock mixture to facilitate re-vegetation of the proposed project area. A ratio of rock to soil (70:30) is recommended. We suggest a soil-rock mixture on top of the rock revetment to allow native riparian vegetation to be planted to ensure SRA habitat is replaced;

(6) Caltrans should use a vibratory hammer whenever possible to avoid acoustic impacts to ESA-listed fish when pile driving. If an impact hammer is necessary, a bubble curtain or other sound attenuation method should be used to reduce impacts;

(7) Construction should occur when vulnerable life stages of listed anadromous fish would be least likely to occur in the project area;

(8) To address potential fish migration concerns upstream and downstream of the RSP placement points, see NMFS Guidelines for Salmonid Passage at Stream Crossings at http://www.westcoast.fisheries.noaa.gov/publications/hydropower/fish_passage_at_stream_crossings_guidance.pdf.;

(9) Minimize bridge demolition impacts by removing the existing superstructure piece by piece and disposing of it in an environmentally conscious way off-site. This includes protecting the river below the bridge by routing any flow around the construction area;

(10) Stabilize and restore the affected project footprint area by applying appropriate soil stabilization and re-vegetation techniques. This may include the implementation of riparian plantings and locally native grass and/or forb seeds to reduce and offset construction impacts. Seeded areas should be covered with broadcast straw and/or seeded erosion control blankets;

(11) Caltrans should continue to work cooperatively with other State and Federal agencies, private landowners, governments, and local watershed groups to identify opportunities for cooperative analysis and funding to support salmonid and sturgeon habitat restoration projects within the Sacramento River watershed;

(12) Caltrans and other local, State, and Federal agencies should provide training for Caltrans environmental and engineering staff that will assist in avoiding or minimizing the impacts of transportation projects on ESA-listed salmonids, NA green sturgeon and their designated critical habitats; and

(13) Caltrans should purchase salmonid habitat restoration credits at a NFMS-approved anadromous fish conservation bank at a 3:1 ratio for the footprint of the project area. The purchase of credits is consistent with 7(a)(l) because it will result in the restoration and long-term preservation of valuable habitat attributes that will improve the survival and recovery of the species.

This response is provided as technical assistance with Caltrans. This response is not intended to take the place of formal comments or consultation as required under the ESA, and does not provide incidental take authorization pursuant to section 7(b)(4) and section 7(o)(2) of the ESA.

Please contact Dylan Van Dyne at (916) 930-3625, or via e-mail at Dylan.VanDyne@noaa.gov if you have any questions or require additional information.

Sincerely,

for Maria C. Rea
Assistant Regional Administrator,
California Central Valley Area Office

Cc: Chron File: ARN 151422-WCR2015-SA00159

Osmondson, Jennifer A@DOT

From: Osmondson, Jennifer A@DOT
Sent: Wednesday, June 08, 2016 1:44 PM
To: 'nmfsswcrca.specieslist@noaa.gov'
Subject: NMFS Species List

NMFS Species List

Federal Agency: Federal Highway Administration – California Division
Federal Agency Address: 650 Capitol Mall, Suite 4-100, Sacramento, CA 95814-4708
Non-Federal Agency Representative: California Department of Transportation
Non-Federal Agency Representative Address: 703 B Street, Marysville, CA 95901
Project Name: I Street Bridge Replacement Project (BRLS-5002(164))
Point-of-Contact: Jennifer Osmondson, Jennifer_Osmondson@dot.ca.gov, (530) 740-4807

Quad Name **Sacramento West**

ESA Anadromous Fish

Central Valley Spring-run Chinook Salmon ESU (T)	**X**
Sacramento River Winter-run Chinook Salmon ESU (E)	**X**
California Central Valley Steelhead DPS (T)	**X**
sDPS Green Sturgeon (T)	**X**

ESA Anadromous Fish Critical Habitat

Central Valley Spring-run Chinook Salmon Critical Habitat	**X**
Sacramento River Winter-run Chinook Salmon Critical Habitat	**X**
California Central Valley Steelhead Critical Habitat	**X**
sDPS Green Sturgeon Critical Habitat	**X**

Essential Fish Habitat

Chinook Salmon EFH	**X**
Groundfish EFH	**X**

Quad Name **Sacramento East**

ESA Anadromous Fish

Central Valley Spring-run Chinook Salmon ESU (T)	**X**
Sacramento River Winter-run Chinook Salmon ESU (E)	**X**
California Central Valley Steelhead DPS (T)	**X**
sDPS Green Sturgeon (T)	**X**

ESA Anadromous Fish Critical Habitat

Central Valley Spring-run Chinook Salmon Critical Habitat	X
California Central Valley Steelhead Critical Habitat	X
sDPS Green Sturgeon Critical Habitat	X

Essential Fish Habitat

Chinook Salmon EFH	X
Groundfish EFH	X

Jennifer Osmondson | Biologist
California Department of Transportation
703 B Street, Marysville, CA 95901
Phone: (530) 740-4807

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
FEDERAL BUILDING, 2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
PHONE: (916)414-6600 FAX: (916)414-6713

Consultation Code: 08ESMF00-2015-SLI-0340 January 27, 2016
Event Code: 08ESMF00-2016-E-01499
Project Name: I Street Bridge Replacement -- created on April 17, 2015 11:24

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2)

of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

Official Species List

Provided by:

Sacramento Fish and Wildlife Office
FEDERAL BUILDING
2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
(916) 414-6600

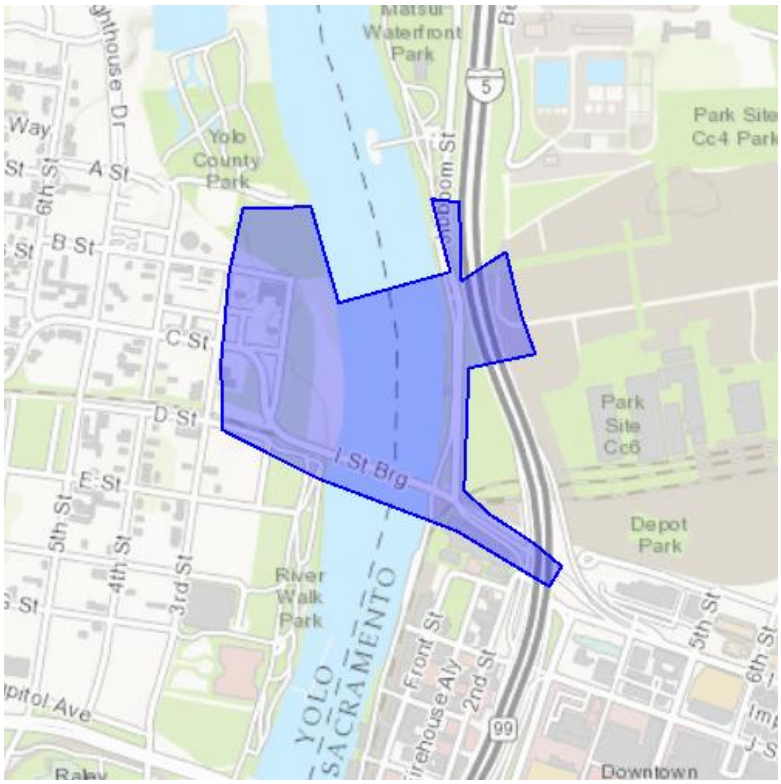
Consultation Code: 08ESMF00-2015-SLI-0340
Event Code: 08ESMF00-2016-E-01499

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Name: I Street Bridge Replacement -- created on April 17, 2015 11:24
Project Description: Construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge and south of Richards Boulevard.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-121.5027735 38.5843329, -121.5047883 38.5852705, -121.5078353 38.5861763, -121.5098974 38.5869831, -121.5099403 38.5881236, -121.5097687 38.5896331, -121.5094683 38.5907719, -121.5079662 38.5908071, -121.5073654 38.5891635, -121.5049192 38.5897002, -121.5053484 38.5909396, -121.5047476 38.5908725, -121.5047047 38.5895308, -121.5037176 38.5900339, -121.5033743 38.5889605, -121.5030739 38.5882896, -121.504533 38.5880548, -121.5046188 38.585975, -121.5041038 38.5855725, -121.5031168 38.5850693, -121.502516 38.5846667, -121.5027735 38.5843329)))

Project Counties: Sacramento, CA | Yolo, CA

Endangered Species Act Species List

There are a total of 9 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Amphibians	**Status**	**Has Critical Habitat**	**Condition(s)**
California red-legged frog *(Rana draytonii)* Population: Entire	Threatened	Final designated	
California tiger Salamander *(Ambystoma californiense)* Population: U.S.A. (Central CA DPS)	Threatened	Final designated	
Birds			
Least Bell's vireo *(Vireo bellii pusillus)* Population: Entire	Endangered	Final designated	
Crustaceans			
Vernal Pool fairy shrimp *(Branchinecta lynchi)* Population: Entire	Threatened	Final designated	
Vernal Pool tadpole shrimp *(Lepidurus packardi)* Population: Entire	Endangered	Final designated	
Fishes			

Delta smelt *(Hypomesus transpacificus)* Population: Entire	Threatened	Final designated	
steelhead *(Oncorhynchus (=salmo) mykiss)* Population: Northern California DPS	Threatened	Final designated	
Insects			
Valley Elderberry Longhorn beetle *(Desmocerus californicus dimorphus)* Population: Entire	Threatened	Final designated	
Reptiles			
Giant Garter snake *(Thamnophis gigas)* Population: Entire	Threatened		

Critical habitats that lie within your project area

The following critical habitats lie fully or partially within your project area.

Fishes	Critical Habitat Type
Delta smelt *(Hypomesus transpacificus)* Population: Entire	Final designated

Appendix B Delineation of Waters of the United States for the I Street Bridge Replacement Project

May 3, 2016

Mr. Marc Fugler
U.S. Army Corps of Engineers
Sacramento District, Regulatory Division
1325 J Street, Room 1350
Sacramento, California 95814-2922

Subject: Request for preliminary jurisdictional determination of the delineation of the proposed I Street Bridge Project, Sacramento County and Yolo County, California

Dear Mr. Fugler:

On behalf of the City of Sacramento and the City of West Sacramento (Cities), ICF International is submitting a Request for Preliminary Jurisdictional Determination (PJD) for the Sacramento River at I Street Bridge project. The City of Sacramento, in cooperation with the City of West Sacramento and the California Department of Transportation, proposes to construct a new bridge over the Sacramento River to replace the existing vehicle crossing that is currently accommodated by the existing I Street Bridge in order to remove a series of functionally obsolete or structurally deficient bridges (i.e., approach structures). The new connection would also reduce future traffic congestion, improve operations and safety, serve multiple modes of transportation, and comply with current American Association of State Highway and Transportation Officials, Caltrans, and local agency design standards.

The Cities plan to submit a permit application for any work below OHWM or in the potential wetland. At this time, the Cities are requesting a PJD of the OHWM of the Sacramento River and the boundary of the potential wetland based on the discussion provided below and the attached delineation map (Exhibit A), photographs, and data forms.

Delineation Area

The delineation area comprises approximately 42 acres surrounding the proposed bridge and approaches (Exhibit A). The proposed bridge site is located over the Sacramento River between the Cities of Sacramento and West Sacramento, approximately 1,000 feet north of the existing I Street Bridge (Figure 1). The delineation area consists of the Sacramento River, riparian woodland, and open space with bike/pedestrian trails along the Sacramento River, local roads, elevated road (viaduct) and bridge approach structures, residential areas, and commercial

development. The delineation area has a relatively high level of historical and ongoing disturbance. Elevations in the delineation area range from -6 to 64 feet above mean sea level.

According to soil data from the Natural Resources Conservation Service, the delineation area contains the following five soil map units and water:

- Orthents-Urban land complex, 0 to 2 percent slopes (Sacramento County)
- Urban land (Sacramento County)
- Lang sandy loam (Yolo County)
- Lang sandy loam, deep (Yolo County)
- Sycamore silt loam (Yolo County)

Of these, Sycamore soils are hydric and inclusions within the map units of Orthents-Urban land and Lang sandy loam are hydric. The soil profile has been disturbed by development in West Sacramento and construction activity in the Sacramento Railyards Specific Plan area.

Methods

ICF wetland ecologist/botanist Lisa Webber conducted the field study on April 8, 2015 on behalf of the Cities in support of the proposed I Street Bridge project. The field study included investigations to identify areas that could be subject to jurisdiction by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA) and the California Department of Fish and Wildlife (DFW) and to evaluate possible environmental constraints. The investigation consisted of walking through the delineation area, mapping the observed OHWM where accessible with a sub-meter accuracy global positioning system (GPS) unit, sampling potential wetland areas using the routine on-site determination method described in the 1987 *Corps of Engineers Wetlands Delineation Manual*, and implementing the supplemental procedures and wetland indicators described in the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Arid West Region*. The wetland ecologist/botanist identified the OHWM of the Sacramento River in the field using the guidance provided in Regulatory Guidance Letter 05-05. This boundary was confirmed using site-specific topographic mapping to identify the location of the 19-foot elevation, which has been identified as the OHWM for the Sacramento River at the existing I Street bridge. Aerial and ground-view photographs of the study area were reviewed prior to the field study.

A total of four data points were examined in the delineation area—two data points to establish the riparian wetland boundary (DP-1w and DP-2u) and two data points to record upland conditions (DP-3u and DP-4u). The data forms are attached.

Results

The delineation area in the City of Sacramento east of the levee is developed, graded, or landscaped. The delineation area in the City of West Sacramento west of the levee includes residences and other buildings with landscaping, as well as ruderal woodland, which supports few native trees and predominantly tree of heaven (*Ailanthus altissima*) [FACU]. One other waters (the Sacramento River) and one potential wetland were identified in the delineation area. These features are further described below.

Other Waters—Sacramento River

The location of the OHWM in the Sacramento River was based on the elevation of 19 feet NGVD that was previously determined by the USACE at the I Street Bridge. Observations in the field further confirmed this location based on the presence of shelving, silt deposition, and wracking. The average width of the Sacramento River at the OHWM is approximately 672 feet, and the delineation area encompasses 4.877 acres of the river (Photo 1). The channel bottom is a natural substrate, presumably sand and sediment, but water turbidity prevented visual confirmation of the composition. The river banks are mostly steeply sloped and support riparian forest vegetation, with riprap near the bottom of the slope.

The cottonwood riparian community on the Sacramento River banks is predominantly mature Fremont cottonwood (*Populus fremontii*) [FAC] trees associated with valley oak (*Quercus lobata*) [FACU] and black walnut (*Juglans californica* var. *hindsii*) [FAC]. Other riparian tree species observed include Oregon ash (*Fraxinus latifolia*) [FACW], boxelder (*Acer negundo* var. *californicum*) [FACW], and black willow (*Salix gooddingii*) [FACW]. The riparian understory on the waterside of the levee is primarily rip-rap with nonnative annual grasses and forbs, however, there are also patches of more typical riparian species, such as narrow-leaf willow (*Salix exigua*) [FACW], Himalayan blackberry (*Rubus armeniacus*) [FACU], and mugwort (*Artemisia douglasiana*) [FAC].

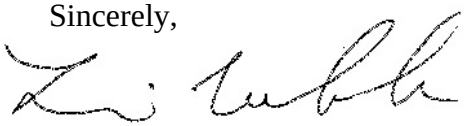
Riparian Wetland

A riparian forest/shrub wetland occurs in the delineation area within riparian habitat that meets all three federal wetland criteria (DP-1w). The riparian wetland is located in the northern portion of the delineation area on the east side of the Sacramento River within a basin (Photo 2). This basin appears to capture overflow from the Sacramento River during high flows. The vegetative composition of riparian forest/shrub wetlands is predominantly cottonwood, but also includes buttonwillow (*Cephalanthus occidentalis* var. *californicus*) [OBL], boxelder, and narrow-leaf willow. Hydric soils in the wetland met the redox depressions (F8) indicator. Wetland hydrology was indicated by observations of water marks (B1), sediment deposits (B2), and oxidized rhizospheres along living roots (C3).

The Cities request verification of the OHWM of the Sacramento River and the extent of the riparian wetland within the delineation area and a preliminary jurisdictional determination according to RGL 08-02. If you require additional information or have any questions regarding this request, please contact me at lisa.webber@icfi.com or Claire Bromund at claire.bromund@icfi.com or either of us by phone at (916) 737-3000.

Thank you for your assistance with this project.

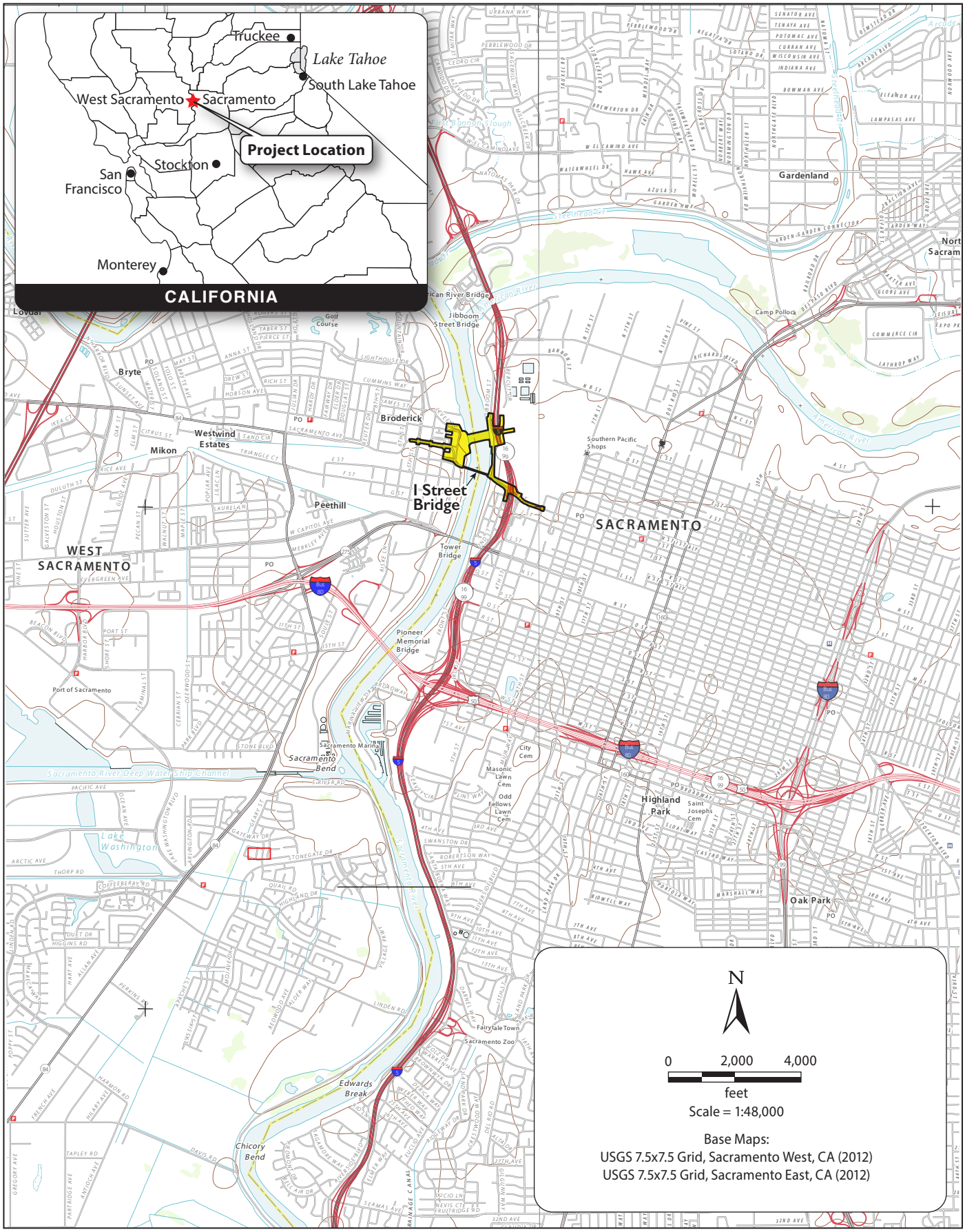
Sincerely,



Lisa Webber
Wetland Ecologist

Attachments:

- Figure 1
- Exhibit A
- Photographs
- Data Forms



Graphics ... 00203.14 (6/10/15) AB

Figure 1
Vicinity Map

121°30'30"W

121°30'20"W

121°30'10"W

38°35'20"N

DP-1w

DP-2u

DP-3u

DP-4u

Sacramento River

I Street Bridge Replacement Project
June 2015

Legend

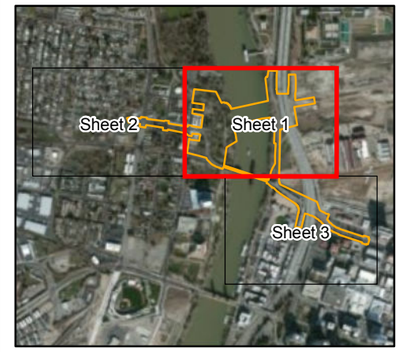
- Delineation Area (42 Acres)
- Data Points
- OHWM
- Temporary Detention Basin

Wetlands

- Riparian Forest/Shrub Wetland (0.249 Acre)

Other Waters

- Tidal Perennial Stream (4.877 Acres)



0 50 100 200
Feet

1 inch = 200 feet

Notes:
Base Map Source: ICFI 2015
Imagery Source: NAIP 2014
USGS Topo Quad: Sacramento West
PLSS: New Helvetia and Wetlands Landgrants

Prepared By: ICFI/ 916.737.3000
Delineated By: L. Webber
Delineation Date: April 9th, 2015
Drawn By: A. Angier

Path: K:\Projects_1\mark_thomas\002203_14_I_St_Bridge\mapdoc\BioWetland_Delineation_20150511.mxd, Author: , Date: 6/12/2015

Exhibit A
Delineation of Potential Waters of the United States, Including Wetlands

121°31'0"W

121°30'50"W

121°30'40"W

38°35'20"N

I Street Bridge Replacement Project
June 2015

Legend

- Delineation Area (42 Acres)
- Data Points
- OHWM
- Temporary Detention Basin

Wetlands

- Riparian Forest/Shrub Wetland (0.249 Acre)

Other Waters

- Tidal Perennial Stream (4.877 Acres)

0 50 100 200
Feet

1 inch = 200 feet

Notes:
Base Map Source: ICFI 2015
Imagery Source: NAIP 2014
USGS Topo Quad: Sacramento West
PLSS: New Helvetia and Wetlands Landgrants

Prepared By: ICFI/ 916.737.3000
Delineated By: L. Webber
Delineation Date: April 9th, 2015
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Path: K:\Projects_1\mark_thomas\00203_14_I_St_Bridge\mapdoc\BioWetland_Delineation_20150511.mxd; Author: ; Date: 6/12/2015

Exhibit A
Delineation of Potential Waters of the United States, Including Wetlands

I Street Bridge Replacement Project
June 2015

Legend

- Delineation Area (42 Acres)
- Data Points
- OHWM
- Temporary Detention Basin

Wetlands

- Riparian Forest/Shrub Wetland (0.249 Acre)

Other Waters

- Tidal Perennial Stream (4.877 Acres)

N

0 50 100 200
Feet

1 inch = 200 feet

Notes:
Base Map Source: ICFI 2015
Imagery Source: NAIP 2014
USGS Topo Quad: Sacramento West
PLSS: New Helvetia and Wetlands Landgrants

Prepared By: ICFI/ 916.737.3000
Delineated By: L. Webber
Delineation Date: April 9th, 2015
Drawn By: A. Angier

Path: K:\Projects_1\mark_thomas\00203_14_1_St_Bridge\mapdoc\Bio\Wetland_Delineation_20150511.mxd; Author: L. Webber; Date: 6/12/2015

Exhibit A
Delineation of Potential Waters of the United States, Including Wetlands

Photo 1. View of proposed I Street Bridge site, looking from West Sacramento toward Sacramento.

Photo 2. Riparian wetland, looking down from the top of the levee slope.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: I Street Bridge City/County: Sacramento/Sac. / West Sacramento/Yolo Sampling Date: 4-8-15

Applicant/Owner: City of Sacramento + City of West Sacramento State: CA Sampling Point: DP-1W

Investigator(s): Webber, Howe Section, Township, Range: T9N, R4E, unnamed section

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): <1%

Subregion (LRR): CLPR Lat: Long: Datum:

Soil Map Unit Name: La (Laug Sandy loam) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: Extreme drought year, but ~1.0" of rainfall in the previous 24 hours.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo	10	N	FACW
2. Cephalanthus occidentalis	30	Y	OBL
3. Populus fremontii	5	N	FAC
4.			
	45% = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 80 % Cover of Biotic Crust 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: DP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR4/2	80	10YR4/6	20	C	PL	SiCl	many roots

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none to 14"

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1) (**Nonriverine**)
- X Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): >14"

Water Table Present? Yes ___ No X Depth (inches): >14"

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >14"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area is in a basin that appears to capture overflow from the Sac. River

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: I Street Bridge City/County: Sacramento/Sac. West Sacramento/Yolo Sampling Date: 4-8-15

Applicant/Owner: City of Sacramento + City of West Sacramento State: CA Sampling Point: DP-24

Investigator(s): Webber, Howe Section, Township, Range: T9N, R4E, unnamed section

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 20

Subregion (LRR): CLRR Lat: Long: Datum:

Soil Map Unit Name: La (Lang Sandy loam) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks: Extreme drought year, but .1" of rainfall in the previous 24 hours.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus fremontii	15	Y	FAC
2.			
3.			
4.			
	15 = Total Cover		
Sapling/Shrub Stratum (Plot size: 20')			
1. Rubus armeniacus	50%	Y	FACU
2.			
3.			
4.			
5.			
	50% = Total Cover		
Herb Stratum (Plot size: 5')			
1. Oxalis pes-caprae	5	N	UPL
2. Galium aparine	20	Y	FACU
3. Hordeum murinum	55	Y	FACU
4. Bromus diandrus	2	N	UPL
5. Bromus tectorum	2	N	UPL
6. Avena fatua	6	N	UPL
7.			
8.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: VP-2 u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					L	wood chunks + some charcoal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock

Depth (inches): 10"

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): >10"

Water Table Present? Yes ____ No X Depth (inches): >10"

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): >10"

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Site on slope above wetland basin.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: I Street Bridge City/County: Sacramento/Sac. West Sacramento/Yolo Sampling Date: 4-8-15

Applicant/Owner: City of Sacramento & City of West Sacramento State: CA Sampling Point: DP-34

Investigator(s): Webber, Howe Section, Township, Range: T9N, R4E, unnamed section

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): slightly concave Slope (%): <1%

Subregion (LRR): CLRR Lat: Long: Datum:

Soil Map Unit Name: On boundary of La (Langsandyloam) & So (Sycamore silt loam) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No ____
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Extreme drought year, but ~1" of rainfall in the previous 24 hours.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Hordeum murinum	30	y	FACU
2. Brassica sp.	20	y	UPL
3. Matricaria discoidea	10	n	FACU
4. Medicago polymorpha	15	y	FACU
5. Geranium dissectum	10	n	UPL
6.			
7.			
8.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 15% % Cover of Biotic Crust Ø

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: Ø (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: Ø (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: UP-3y

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 4/3	100					FSL	
6-9	2.5Y 4/3	80	7.5YR 2.5/1	20	C	PL	scl	
9-12	2.5Y 5/2	100%					C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: clay layer

Depth (inches): 12"

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): >12"

Water Table Present? Yes ___ No X Depth (inches): >12"

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >12"

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators, no surface water despite recent rain.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: I Street Bridge City/County: Sacramento/Sac. West Sacramento/Yolo Sampling Date: 4-8-15

Applicant/Owner: City of Sacramento & City of West Sacramento State: CA Sampling Point: DP-4

Investigator(s): Webber, Howe Section, Township, Range: T9N, R4E, unnamed section

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): CLRR Lat: Long: Datum:

Soil Map Unit Name: 186 (Orthents-Urban land complex, 0-2% slopes) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Extreme drought year, but ~1" of rainfall in the previous 24 hours. Located in railyard construction area.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Polypogon monspeliensis	5	N	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 95% % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x 1 =	____
FACW species	____	x 2 =	____
FAC species	____	x 3 =	____
FACU species	____	x 4 =	____
UPL species	____	x 5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Veg is sparse. Located in a disturbed construction area with fire tracks.

SOIL

Sampling Point: DP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/2	100					Sil	gravel / fill

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock / fill

Depth (inches): 3-4

Hydric Soil Present? Yes ____ No X

Remarks: Site is in Sec. railyard construction area

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 2"

Water Table Present? Yes X No ____ Depth (inches): to surface

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): to surface

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology is temporary, due to construction activity and grading. Current surface water is due to recent rain.

Appendix C Representative Photographs

Appendix C Representative Photographs

Photo 1. Sacramento River and riparian habitat, looking east

Photo 2. Sacramento River and riparian habitat, looking west

Photo 3. Riparian forest/shrub wetland

Photo 4. Riparian forest/shrub wetland

Photo 5. Ruderal woodland west of bridge ramp

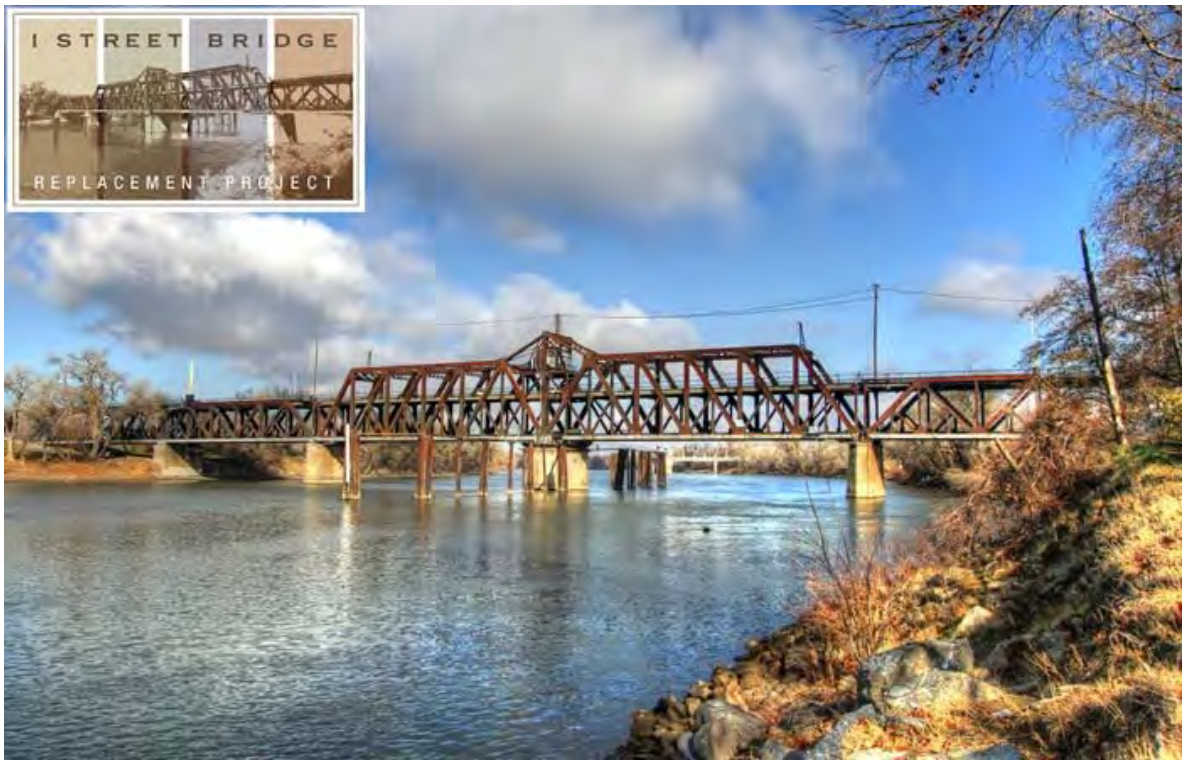
Photo 6. Ruderal woodland on north side of C Street

Photo 7. Ruderal woodland east of bridge ramp

Photo 8. Landscaped at edge of Bercut Drive

Photo 9. Developed/Graded under I-5

Photo 10. Underside of Jibboom Street viaduct



Noise Study Report

I Street Bridge Replacement Project

Sacramento and Yolo Counties

Federal Project No.: 5002(164)

June 2015

Caltrans

CALIFORNIA DEPARTMENT OF TRANSPORTATION

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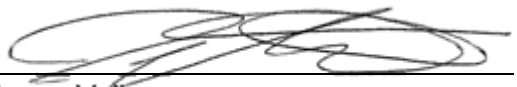
Prepared By:  Date: June 22, 2015

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Summary

The purpose of this Noise Study Report is to evaluate noise impacts and abatement, if necessary, under the requirements of Title 23 of the Code of Federal Regulations (CFR) Part 772, "Procedures for Abatement of Highway Traffic Noise," related to construction and operation of the I Street Bridge Replacement Project located in Sacramento, California.

A field investigation was conducted to identify land uses that could be subject to traffic and construction noise impacts resulting from the proposed project. Single-family and multifamily residences were identified as Activity Category B land uses in the project area. Outdoor use areas associated with parks were identified as Activity Category C land uses. Commercial (Activity Category F) and undeveloped (Activity Category G) land uses are also located in the study area. Activity Categories F and G uses do not have noise abatement criteria and therefore are not subject to noise impacts.

Traffic noise levels were predicted using the Federal Highway Administration (FHWA) Traffic Noise Model (TNM), Version 2.5. Existing worst-hour traffic noise levels were found to range from 46 to 71 A-weighted decibels hourly equivalent sound level (dBA Leq[h]).

For the design year (2040) under no-build conditions, predicted traffic noise levels were found to range from 49 to 73 dBA Leq(h). For the design year build conditions, noise levels were found to range from 49 to 74 dBA Leq(h). Traffic noise levels would approach or exceed the noise abatement criteria at single- and multifamily residential (Activity Category B) and park (Activity Category C) receivers identified in this analysis. Traffic noise impacts therefore are predicted to occur at these locations under design year build conditions. Two design options were evaluated for a realignment of Second Street, and roundabout and signalized configurations were evaluated for the I Street/I-5 interchange.

Pursuant to California Department of Transportation (Caltrans) and FHWA regulations and guidance, noise abatement must be considered for land uses where traffic noise impacts are predicted to occur. For noise-sensitive receptors where traffic noise levels were predicted to approach or exceed the noise abatement criteria, noise abatement in the form of barriers was considered. Noise barriers were evaluated for eight locations where Activity Category B or Activity Category C receivers were predicted to be affected due to the project. None of these barriers were found to be feasible because of driveway or public roadway access requirements, no presence of frequent outdoor use areas, or conflicts with public sidewalks.

During construction of the proposed project, noise from construction activities would intermittently dominate the noise environment in the immediate area of construction. Conventional construction equipment is expected to generate maximum noise levels ranging from 75 to 96 dB at a distance of 50 feet. Noise from pile driving would generate maximum noise levels of approximately 101 dB at a distance of 50 feet. Noise produced by construction equipment would diminish over distance at a rate of approximately 6 dB per doubling of distance. No adverse noise impacts from construction are anticipated because construction would be conducted in accordance with Caltrans' provisions in Section 14-8.02, "Noise Control," of the *Caltrans Standard Specifications* and applicable local noise standards.

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List of Abbreviated Terms

ADA	Americans with Disabilities Act
BMPs	best management practices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CIDH	cast-in-drill-hole
CNEL	Community Noise Equivalent Level
CVFPB	Central Valley Flood Protection Board
dB	decibels
dBA	A-weighted decibels
dBA Leq[h]	A-weighted decibels hourly equivalent sound level
FHWA	Federal Highway Administration
HBP	Highway Bridge Program
Hz	Hertz
I-5	Interstate 5
K-factors	calibration factors
kHz	kilohertz
Ldn	Day-Night Level
Leq	Equivalent Sound Level
Leq[h]	1-hour A-weighted equivalent sound level
Lmax	Maximum Sound Level
Lxx	Percentile-Exceeded Sound Level
MTP/SCS	Metropolitan Transportation Plan/Sustainable Communities Strategy
NAC	noise abatement criteria
NEPA	National Environmental Policy Act
NSR	Noise Study Report
Protocol	Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects
RSP	rock slope protection
SACOG	Sacramento Area Council of Governments
SPL	sound pressure level
TeNS	Technical Noise Supplement

TNM	Traffic Noise Model
USC	U.S. Code
USCG	U.S. Coast Guard
µPa	micro-Pascals

Chapter 1 Introduction

The City of Sacramento, in cooperation with the City of West Sacramento and the California Department of Transportation (Caltrans), proposes to construct a new bridge over the Sacramento River to replace the vehicle crossing that is currently accommodated by the existing I Street Bridge in order to remove a series of functionally obsolete or structurally deficient bridges (i.e., approach structures). The new connection also would reduce future traffic congestion, improve operations and safety, serve multiple modes of transportation, and comply with current American Association of State Highway and Transportation Officials, Caltrans, and local agency design standards.

The project is subject to state and federal environmental review requirements because of use of federal Highway Bridge Program (HBP) funds from the Federal Highway Administration (FHWA). Accordingly, project documentation is being prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The City of Sacramento is the lead agency under CEQA, with the City of West Sacramento as a responsible agency, and Caltrans is the lead agency under NEPA. The FHWA's other responsibilities for environmental review, consultation, and any other action required in accordance with applicable federal laws for this project will be carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S. Code (USC) 327.

This project is included in the Sacramento Area Council of Governments (SACOG) 2035 *Metropolitan Transportation Plan/Sustainable Communities Strategy* (MTP/SCS).

The purpose of this Noise Study Report (NSR) is to evaluate noise impacts and abatement under the requirements of Title 23, Part 772, of the Code of Federal Regulations (CFR), "Procedures for Abatement of Highway Traffic Noise," related to construction and operation of the I Street Bridge Replacement Project. Specifically, 23 CFR 772 provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects. According to 23 CFR 772.3, all highway projects that are developed in conformance with this regulation are deemed to be in conformance with FHWA noise standards.

Caltrans' Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects (Protocol), dated May 2011, provides Caltrans policy for implementing 23 CFR 772 in California. The Protocol outlines the requirements for preparing NSRs.

1.1 Project Location

The proposed project is located over the Sacramento River between the cities of Sacramento and West Sacramento, approximately 1,000 feet north of the existing I Street Bridge (Figures 1-1 and 1-2). The project limits starting within the City of Sacramento consist of Railyards Boulevard from 200 feet east of Bercut Drive on the east, continuing west over the Sacramento River into the City of West Sacramento along C Street, and terminating approximately 100 feet west of the 5th Street intersection. The project limits also extend along Bercut Drive approximately 500 feet

north of Railyards Boulevard, along Jibboom Street 550 feet north of Railyards Boulevard and 300 feet south of Railyards Boulevard, along 3rd Street 50 feet north and south of C Street, along 4th Street 50 feet north and south of C Street, and along 5th Street 50 feet north and south of C Street. The total length of the project is approximately 0.42 mile along C Street and Railyards Boulevard.

1.2 Purpose and Need

The proposed project would construct a new bridge over the Sacramento River between the Cities of Sacramento and West Sacramento to replace the vehicle crossing that is currently provided by the existing I Street Bridge. Construction of the proposed project has independent utility; the project is not dependent on other projects or improvements to meet the purpose and need.

Termini for the proposed project were developed through an iterative process involving engineering design and traffic operations analysis. Preliminary design concepts were tested with the traffic operations analysis model to evaluate how lane configurations influenced peak-hour conditions.

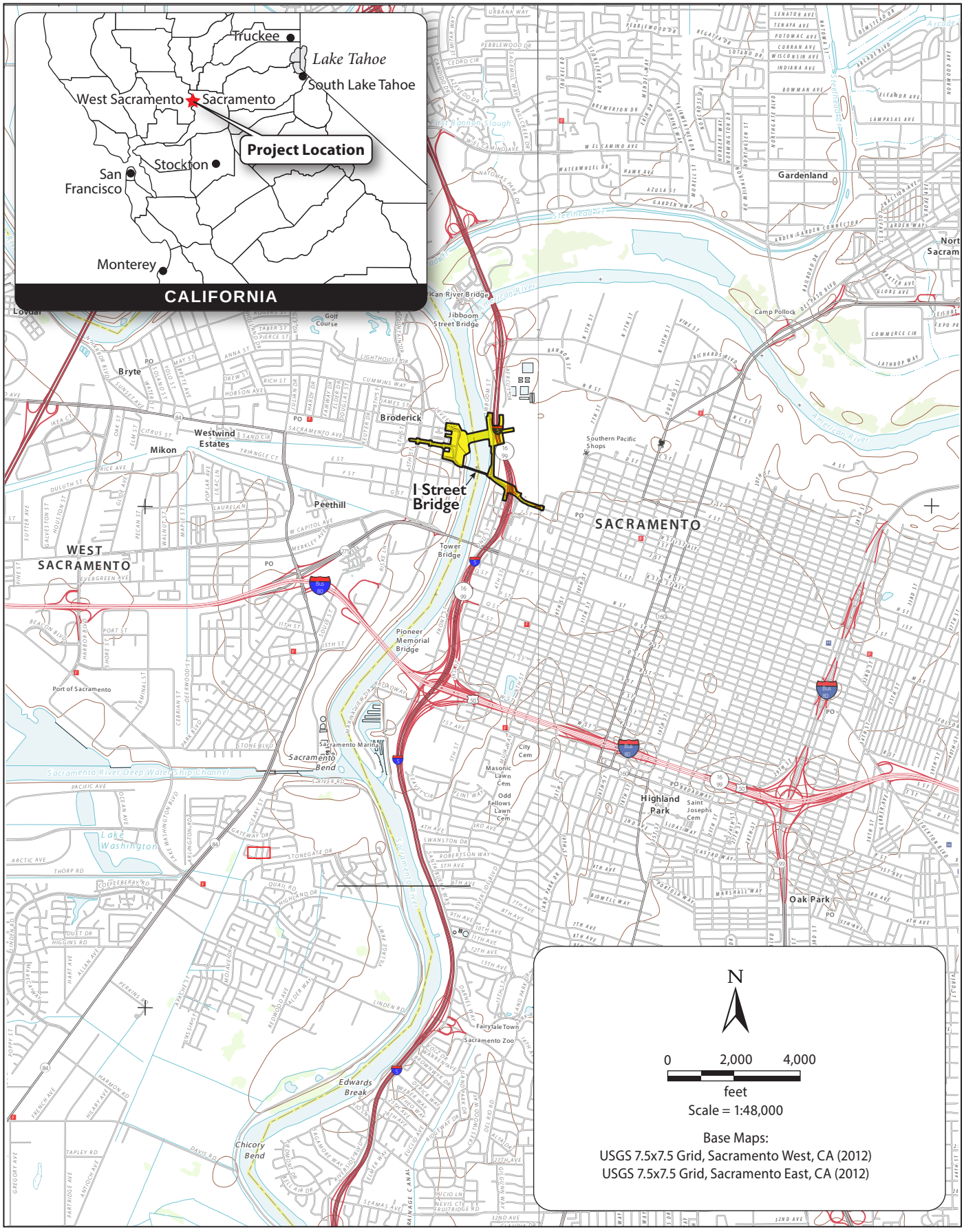

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Figure 1-1
Vicinity Map

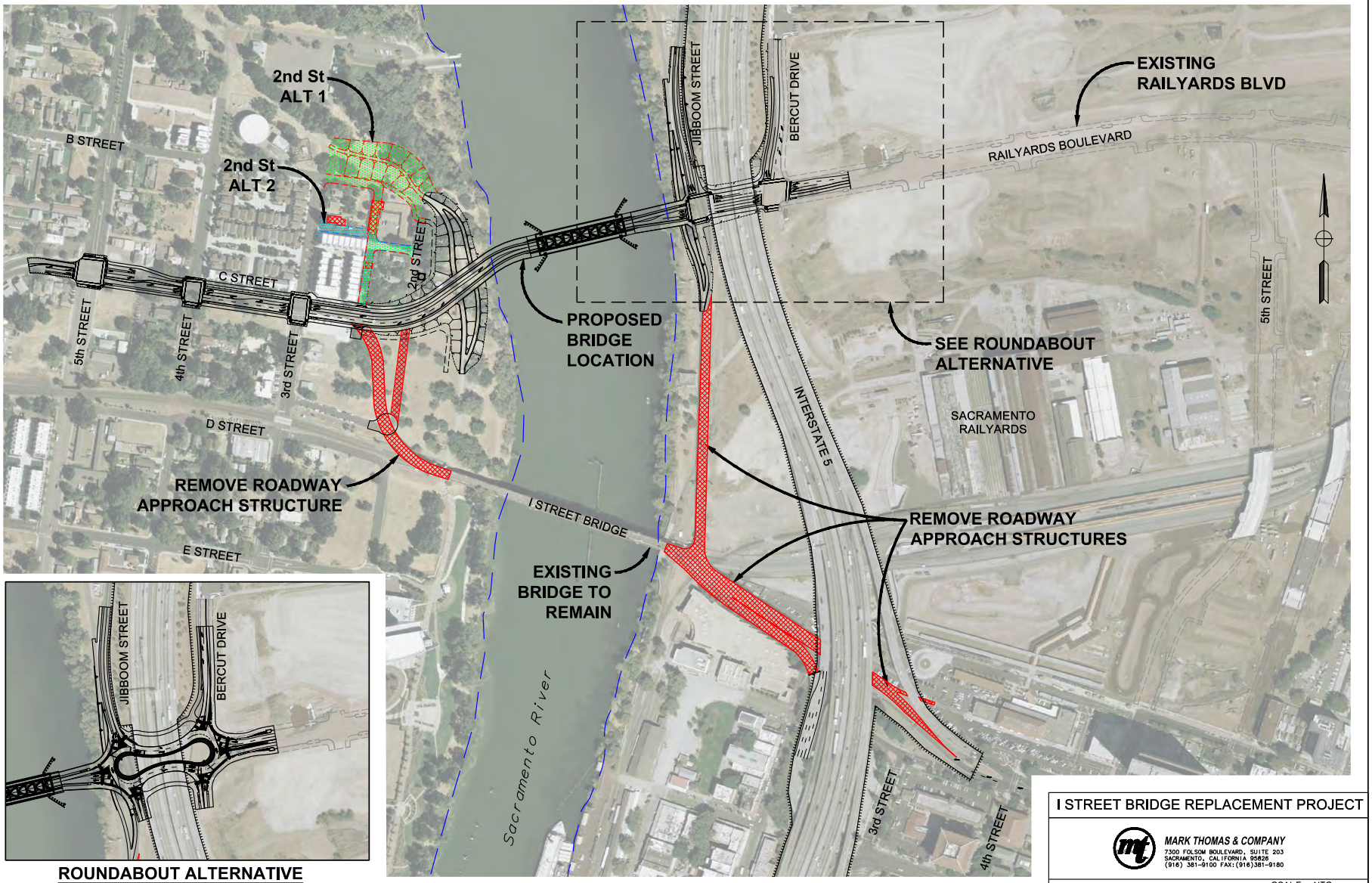

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Figure 1-2
Proposed Project

1.2.1 Purpose

The purpose and objectives of the project are listed below.

- The project should construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge from C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento, consistent with the adopted findings of the Sacramento River Crossings Alternatives Study for Bridge Location 2 in the North Market Area.
- The new bridge should meet the requirements of the Neighborhood Friendly Bridge definition that the City of Sacramento City Council adopted by resolution on October 18, 2011, which is defined by the following elements.
  - A facility whose primary function is local connectivity rather than regional travel and primarily serves short local trips.
  - A bridge which serves all users, including motorists, bicyclists, pedestrians, low energy vehicles, and public transit riders.
  - A bridge with aesthetics and dimensions which are architecturally pleasing and contextually appropriate for the adjacent neighborhoods.
  - A bridge that does not exceed or expand the already-planned capacity of the approach roadways (i.e., no widening of approaches just to accommodate bridge flows).
  - A facility which is designed with a target speed equal to or less than the approach roadways.
  - A bridge which reduces the growth in vehicle miles traveled in the adjacent communities.
  - A bridge that does not connect directly to streets which are primarily residential in character.
  - A bridge that is consistent with the Need and Purpose statement [the adopted Sacramento River Crossings Alternatives Study statement] as articulated.
- In addition to the Neighborhood Friendly Bridge definition, the project should include pedestrian and bicycle facilities in the new public crossing that meet Americans with Disabilities Act (ADA) requirements, and facilitate connections to and from the new crossing and the Sacramento River Parkway and Riverfront Park trails.
- The proposed project also would need to construct a movable bridge that satisfies the vertical clearance and river navigation requirements of the U.S. Coast Guard (USCG).
- The project design should not preclude future addition of a streetcar, a separate, stand-alone project being developed by the Cities of West Sacramento and Sacramento.
- The new bridge also is intended to improve the connectivity to, and accessibility of, businesses, recreational areas, and new or redevelopment opportunity sites located in the urban core of Sacramento and West Sacramento.

1.2.2 Need

The project is needed for the following reasons.

- The existing I Street Bridge does not fully comply with current design and traffic operation standards due to the following conditions.
  - I Street Bridge limits or restricts traffic capacity and multimodal use. The current bridge width is not sufficient to provide adequate traffic operations, bicycle lanes, or the ability for transit service across the bridge.
  - The I Street Bridge and the four associated approach structures are on the federal eligible bridge list for federal funds for replacement and/or rehabilitation through the HBP. The I Street Bridge has been classified as functionally obsolete, and the existing approach structures have been classified as structurally deficient. The Cities of Sacramento and West Sacramento have decided to pursue replacement through the HBP.
- As adopted by the Sacramento City Council, new crossings of the Sacramento River between the City of Sacramento and City of West Sacramento shall be Neighborhood Friendly. In coordination with staff from the City of West Sacramento and SACOG, the definition for a Neighborhood Friendly Bridge was developed by the City of Sacramento and the Sacramento City Council adopted the definition by resolution in October 2011. The replacement bridge structure is required to be consistent with the Neighborhood Friendly Bridge definition.
- In addition to the Neighborhood Friendly Bridge requirements, lack of ADA compliance, non-standard and non-continuous sidewalks, and lack of bicycle facilities discourage walking and bicycling on the existing I Street Bridge.
- Section 9 of the Rivers and Harbors Act requires any local, state, or federal agency planning to construct a bridge over a navigable waterway to apply for a bridge permit through the USCG. The USCG requires the new bridge to meet or exceed the existing vertical clearance along the river, which is currently set by the US 50 Pioneer Bridge. In order to comply with the Neighborhood Friendly Bridge definition and meet the USCG requirements for navigation clearance, the new bridge will need to be movable.
- The SACOG MTP/SCS identifies that a proposed streetcar will cross over the new bridge from Sacramento to West Sacramento. While the streetcar will be a separate, stand-alone project, the bridge design must not preclude the future addition of a streetcar.
- Limited connectivity to the riverfront reduces the potential to achieve planned urban development and redevelopment of opportunity sites identified in the adopted plans of Sacramento and West Sacramento.

Chapter 2 Project Description

This section describes the proposed action and the design alternatives that were developed to meet the identified need through accomplishing the defined purpose(s), while avoiding or minimizing environmental impacts. The alternatives under consideration are one bridge alignment for the new bridge over the Sacramento River and two alternatives for portions of the roadway design in Sacramento and in West Sacramento.

- City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection
  - Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive
  - Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive
- City of West Sacramento Residential Access
  - Alternative 1—C Street Connection to B Street
  - Alternative 2—C Street Connection to 3rd Street
- No-Build (No-Project) Alternative

The proposed project is located in Sacramento and Yolo Counties, over the Sacramento River and between the Cities of Sacramento and West Sacramento, and approximately 1,000 feet north of the existing I Street Bridge (Figure 1-1). The total length of the project is approximately 0.42 mile along C Street and Railyards Boulevard. The purpose of the project is to construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge from C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento in order to remove a series of functionally obsolete or structurally deficient bridges, consistent with the adopted findings of the Sacramento River Crossings Alternatives Study for Bridge Location 2 in the North Market Area.

2.1 Build Alternatives

One alignment is proposed for the new bridge over the Sacramento River. A new approximately 860-foot bridge, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides, is proposed. The bridge would include two fixed-span approach structures, approximately 200 feet and 270 feet in length, that tie into the Sacramento and West Sacramento banks of the river, respectively. The center span of the bridge would be an approximately 330-foot movable span that meets the USCG requirements. Roadway improvements on Railyards Boulevard in Sacramento and C Street in West Sacramento also are proposed. In both Sacramento and West Sacramento, two alternatives for portions of the roadway design are being considered.

- City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection
  - Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive
  - Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive

In the City of Sacramento, Alternative 1 consists of a signalized intersection at Jibboom Street and Bercut Drive, while Alternative 2 consists of a roundabout between these two intersections. Beyond the Jibboom Street and Bercut Drive intersections, the remaining project elements and limits in the City of Sacramento are similar under both alternatives.

- City of West Sacramento Residential Access
  - Alternative 1—C Street Connection to B Street
  - Alternative 2—C Street Connection to 3rd Street

In the City of West Sacramento, the proposed C Street alignment would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. Two alternatives are proposed for maintaining access to these parcels. Alternative 1 would construct a new connection to C Street, approximately 150 feet east of the C Street/3rd Street intersection, that would extend north to B Street and then ultimately connect to the 3rd Street/B Street intersection. Alternative 2 would connect to the same location at C Street as Alternative 1, approximately 150 feet east of the C Street/3rd Street intersection, but would continue north approximately 300 feet, then make a 90-degree left turn, and connect to 3rd Street approximately 300 feet north of C Street.

2.1.1 Common Design Features of the Build Alternatives

The proposed project would construct a new bridge over the Sacramento River between Sacramento and West Sacramento to replace the vehicular crossing that is provided by the existing I Street bridge. The project would facilitate vehicular and multimodal traffic over the river in order to reduce traffic congestion, improve safety, and remove a number of structurally deficient or functionally obsolete bridges that have reached the limit of their design life. While the existing I Street Bridge over the Sacramento River would remain in-place, the approach structures leading up to the bridge from both directions would be demolished. See Figure 1-2 for a depiction of the project limits and the approach structures that would be removed.

The Sacramento River is considered to be a navigable waterway of the United States. Under the provisions of the General Bridge Act of 1946, as amended, the USCG must approve proposed location and plans for bridges over navigable waters of the United States prior to commencing construction. In order to comply with the adopted Neighborhood Friendly Bridge definition and the USCG requirement to maintain navigation along the river, the new bridge is proposed to be a movable bridge.

Common design features of the build alternatives are listed below.

2.1.1.1 New Bridge Construction and Roadway Modifications

Bridge Construction

The proposed project would construct a new bridge over the Sacramento River. The total bridge length would be approximately 860 feet long, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides of the bridge. The bridge would include two fixed-

span approach structures that tie into the Sacramento and West Sacramento banks of the river and are approximately 200 feet and 270 feet in length, respectively. The center span of the bridge would be a movable span that meets the USCG requirements. The movable span is anticipated to be approximately 330 feet in length. The bridge soffit elevation would be set 3 feet above the 200-year water surface elevation to comply with the Central Valley Flood Protection Board (CVFPB) freeboard requirements.

The two fixed-span approach structures would be 72 feet wide, with a superstructure depth (or total bridge thickness) of approximately 6 feet. Each approach structure would be a two-span bridge. The abutment at one end of the structure would be constructed on the banks of the river, a center pier would be placed within the river approximately around the existing bank toe of slope, and the other end of the approach structure would be constructed on the piers for the movable span.

Based on coordination with the USCG, the movable span would provide a 278-foot clear channel opening approximately centered at the middle of the river. As such, the movable span has been identified as a vertical lift bridge, which would raise the bridge to a minimum vertical clearance of 59 feet over the maximum river elevation of 31 feet (measured to the NGVD 29 vertical datum). The truss depth of the movable span would be approximately 40 feet, with 6 feet of the structure being below the bridge deck and 34 feet above the bridge deck. The vertical towers would be approximately 130 feet tall, measured from the bridge soffit elevation. The vertical towers would be approximately 33 feet in thickness and the same width as the bridge deck. The total bridge width on the movable span would be 81 feet.

Due to the existing soil conditions, the bridge would be constructed on deep pile foundations. The abutments for the fixed-span approach structures at the river bank would consist of approximately 50 piles per abutment that are driven or cast-in-drill-hole (CIDH), to a depth of approximately 70 feet below the original ground elevation. The center piers for the two fixed-span approach structures (located approximately at the bank toe of slope in the river, below the ordinary high water mark) would consist of 50 driven or CIDH piles per pier that are approximately 70 feet below the original ground elevation. If driven piles are selected for either the abutments or piers, the piles would be precast concrete or steel. The foundations for the movable span would consist of four large-diameter cast-in-steel-shell piles per pier. Each pile would be 9 feet in diameter, extending approximately 140 feet below the original ground elevation.

Erosion control measures would be installed around the proposed bridge foundations to prevent future scour at the bridge supports. It is anticipated that rock slope protection (RSP) would be installed around the bridge abutments and piers within the water to control erosion.

A bridge fender system also is planned around the movable span piers to protect the piers from errant watercrafts that are navigating along the river. The fender system would include approximately 30 driven concrete or wooden piles around each of the movable span piers. The piles would be driven to a depth of approximately 30 feet below the original ground elevation.

Temporary Falsework

Temporary falsework platforms would be required to construct the proposed bridge foundations and approach structures. The platforms would be constructed using temporary piles within the river that would be installed on or after April 15; they would be removed by October 31 of each year, and following completion of construction. In addition, temporary cofferdams would be required to construct the bridge piers within the water. The cofferdams would consist of temporary sheetpiles installed around the individual piers. Dewatering inside the cofferdams would be required.

Roadway Modifications

City of Sacramento

In Sacramento, Bercut Drive would be modified from Railyards Boulevard north approximately 500 feet. Bercut Drive would be designed to have two northbound lanes at the Railyards Boulevard intersection, tapering down to one northbound lane at the northern project limits, and one southbound lane. Improvements to Bercut Drive south of Railyards Boulevard are not part of, nor needed for, the proposed project and would be constructed if needed as part of a separate future project.

Proposed improvements on Jibboom Street would extend 550 feet north of Railyards Boulevard. The roadway would consist of one travel lane in each direction, on-street Class II bike lanes, sidewalk along the west side of the roadway, and retaining walls of various heights along both sides of the road. Extension of Jibboom Street south of Railyards Boulevard is not included with, nor needed for, the proposed project and would be constructed if needed as part of a separate future project.

The proposed roadway profile for Railyards Boulevard would be approximately 6 feet higher than the original ground elevation at the Jibboom Street intersection. The profile adjustment is needed in order to satisfy the CVFPB requirements to provide 3 feet of clearance between the 200-year-flood water surface elevation and the bridge soffit (or low chord of the bridge).

City of West Sacramento

Between the bridge touchdown location along C Street in West Sacramento and the 4th Street/ C Street intersection, the roadway would consist of one westbound travel lane, two eastbound travel lanes (the two eastbound travel lanes would taper down to one eastbound lane east of the 3rd Street intersection), a center left-turn lane, on-street Class II bike lanes, on-street parking along the north side of the roadway, and sidewalks along both sides of the roadway. As the roadway through this section currently consists of the proposed number of travel lanes, the widening through this area is primarily needed to support the Class II bike lanes and wider sidewalks.

Along C Street between 4th Street and 5th Street, the roadway would consist of one travel lane in each direction, left-turn lanes, on-street Class II bike lanes, and sidewalks along both sides of the

road. All of the improvements through this section would be accommodated within the existing roadway limits.

2.1.1.2 Class I Bikeway and Levee Modifications and Improvements

City of Sacramento

The existing Class I Sacramento River Parkway along Jibboom Street would be reconstructed approximately 500 feet north and 300 feet south of Railyards Boulevard as part of the proposed project. In order to maintain a continuous off-street Class I path along this section, the path would be grade-separated under the proposed bridge structure. Cyclists and pedestrians approaching Railyards Boulevard in either direction would have the option to continue along the path under the new structure, avoiding the need to cross the roadway. Cyclists and pedestrians who are traveling along the path also would have the option to connect to Railyards Boulevard and cross over the proposed bridge into West Sacramento or turn east into Sacramento. Due to the limited horizontal clearance between the river and the Interstate-5 (I-5) viaduct structure, retaining walls would be needed along the path to account for the vertical elevation difference between Jibboom Street and the path that continues under the proposed bridge structure. The maximum retaining wall height along the bike path would be 16 feet.

City of West Sacramento

The proposed project would require improvements to the existing levee along the West Sacramento side of the river, where the proposed bridge alignment would connect to C Street. The existing levee does not meet current standards required by Title 23 of the California Code of Regulations. Extending approximately 300 feet north and south of the proposed C Street alignment, the levee cross-section would be reconstructed to meet current design standards, which would require 3:1 side slopes on the landside and waterside of the levee, and a 20-foot-wide crown at the top of the levee. The levee improvements also would include a slurry cutoff wall extending to a depth of 110 feet below the original ground elevation. In addition, the proposed roadway profile would be approximately 6 feet higher than the original ground elevation as it crosses over the levee. In order to maintain access to the levee for inspection and maintenance services, access roads would be constructed from the new roadway to the top of the improved levee section. The proposed grading for the levee would require relocation of the existing water tower that is located along 2nd Street, just north of the proposed C Street alignment. The tower would be relocated to the northwest, approximately 43 feet from its existing location.

The new levee maintenance road also would serve as the future Class I River Walk Park trail extension in West Sacramento. Similar to the trail improvements proposed as part of the project in Sacramento, the trail would be grade-separated under the proposed bridge structure. Cyclists and pedestrians approaching C Street in either direction would have the option to continue along the trail under the new structure, avoiding the need to cross the roadway. Cyclists and pedestrians who are traveling along the trail also would have the option to connect to C Street to cross over the proposed bridge into Sacramento or head west on C Street.

2.1.1.3 Storm Water Drainage Management

Drainage for the proposed roadway would be conveyed to the existing storm drain system installed within Railyards Boulevard and C Street. Railyards Boulevard currently drains storm water to the east along the roadway and then into a retention basin south of Railyards Boulevard. C Street drains storm water west along the roadway and then ultimately south beyond the project limits.

As is standard with all construction projects, the contractor would be required to install temporary best management practices (BMPs) to control any runoff or erosion from the project site into the surrounding waterways. These temporary BMPs would be installed prior to any construction operations and would be in place for the duration of the contract. The removal of these BMPs would be the final operation, along with project site cleanup.

2.1.1.4 Structure Demolition and Roadway Modifications

Following completion of the new bridge connections at Railyards Boulevard and C Street, traffic would be diverted to the new bridge, and the four existing approach structures to the I Street Bridge would be removed. Bridge numbers 24C0364L, 24C0364R, 22-0033, and 22C0154 would be demolished and the foundations would be removed to a depth of 3 feet below the original ground elevation. Encroachment permits from Caltrans and Union Pacific Railroad would be needed to complete the bridge removal. The existing I Street Bridge is owned and operated by Union Pacific Railroad and would continue to remain in-place and used by trains following construction of the new bridge.

As part of the removal of the existing approach structures, the project would include modifications to I Street within the City of Sacramento from the southbound I-5 on-ramp east to the 5th Street intersection. The modification would include signing and striping revisions, demolition of existing roadway sections that are no longer required, and removal of bridge abutments and foundations.

2.1.1.5 Staging, Storage, and Proposed Access during Construction

Two staging areas would be used to store materials and equipment during construction, such as pipe materials, precast manholes and drop inlets, steel girders, piles, and rebar, along with the construction equipment when not in use. One area would be located south of Railyards Boulevard under I-5 in Sacramento; the other area would be located west of the landward side of the levee, south of the new bridge location in West Sacramento. The staging area located along Railyards Boulevard would be accessed via the existing intersection at Jibboom Street. The staging area in West Sacramento would be accessed via the existing 2nd Street connection at 3rd Street, south of C Street. The staging areas would be in use throughout the construction duration; the areas would be returned to their pre-project conditions at the completion of the project.

2.1.1.6 Utility Relocations

A number of public and private utilities would need to be relocated or adjusted to grade as part of the project, including existing water, sewer, gas, electric, and communication facilities within Jibboom Street, Bercut Drive, C Street, and 2nd Street.

2.1.1.7 Traffic Management and Detours during Construction

While most of the project would be constructed outside of existing roadways, some areas would require temporary detours or staged construction.

Along Jibboom Street at the proposed Railyards Boulevard intersection, the new roadway profile would be raised approximately 6 feet above the original ground elevation. To maintain access to the existing Jibboom Street viaduct south of Railyards Boulevard during the roadway construction, a temporary access road would be needed. The proposed temporary access road would connect to the existing Jibboom Street viaduct abutment approximately 350 feet south of Railyards Boulevard. The temporary road would then continue under I-5 and connect to the Railyards Boulevard/Bercut Drive intersection. The temporary road would require placement of temporary fill material and a roadway structural section that would be removed after construction of the new bridge. Traffic traveling north along Jibboom Street would continue north along Bercut Drive to access the Richards Boulevard/I-5 interchange.

In order to complete the improvements at Jibboom Street and Railyards Boulevard, Jibboom Street would be closed to traffic approximately 600 feet north of Railyards Boulevard. Traffic traveling south along Jibboom Street to continue over the existing I Street Bridge into West Sacramento would be detoured over to Bercut Drive at Richards Boulevard. Traffic would then use the temporary access road to connect to the Jibboom Street viaduct structure. The temporary access road would be in place for approximately 2 years, after which traffic would use the new roadways and new bridge.

The Sacramento River Parkway trail along Jibboom Street also would require temporary re-routing during construction. The temporary alignment for the trail would follow the temporary Jibboom Street alignment south of Railyards Boulevard. Cyclists and pedestrians would then continue following a detour north along Bercut Drive to Richards Boulevard, where they could then connect back to the Parkway on the west side of I-5. The detour would be in place for approximately 2 years.

During construction, traffic along C Street would be maintained along the existing approach structure until the new bridge is constructed.

2.1.1.8 Project Construction Sequence

New bridge and roadway construction would occur first, followed by demolition of the four approach structures that connect to the existing I Street Bridge. Once the new bridge and roadways are constructed, traffic would be diverted to the new bridge in order to allow demolition adjacent to the existing bridge. Construction of the project is expected to take approximately 30 months.

2.1.1.9 Property Acquisition

The project would require temporary and permanent property acquisitions along C Street, 3rd Street, and 2nd Street within the City of West Sacramento and along Railyards Boulevard, Jibboom Street, Bercut Drive, and I Street within the City of Sacramento.

Along C Street, temporary and permanent acquisitions would be required along the south side of the roadway to accommodate the construction of standard shoulders, bike lanes, and sidewalks—from the intersection of 4th Street to the Sacramento River.

Along 3rd Street and 2nd Street, temporary and permanent acquisitions would be needed from the Union Pacific Railroad on the south, to just north of the B Street intersections, for construction of the proposed roadway and levee improvements.

Along Railyards Boulevard, Jibboom Street, and Bercut Drive, temporary and permanent acquisition would be needed from the current state-owned right-of-way for I-5, for construction of the roadway. In addition, temporary and permanent acquisitions would be needed along Jibboom Street for the proposed temporary detour road and Class I bikeway improvements.

Temporary acquisition would be required along the existing I Street connection to facilitate removal of the existing viaduct structures. Due to the limited space available in Old Sacramento, it is anticipated that construction activities would occur from the parking lot at the intermodal station.

2.1.2 Unique Features of Build Alternatives

In both the City of Sacramento and the City of West Sacramento, two alternatives for portions of the roadway design are being considered.

2.1.2.1 City of Sacramento Railyards Boulevard/Jibboom Street/Bercut Drive Intersection

Alternative 1 consists of a signalized intersection at Jibboom Street and Bercut Drive, while Alternative 2 consists of a roundabout between these two intersections. Beyond the Jibboom Street and Bercut Drive intersections, the remaining project elements and limits are similar under both alternatives.

Alternative 1—Signalized Intersection at Jibboom Street and Bercut Drive

Under Alternative 1, Railyards Boulevard would be extended west over the Sacramento River; east of Bercut Drive. Railyards Boulevard would consist of two westbound lanes and one eastbound lane. Between Jibboom Street and Bercut Drive, Railyards Boulevard would consist of two westbound lanes and three eastbound lanes; two eastbound lanes would be trapped into left-turn lanes onto Bercut Drive, and one eastbound lane would continue along Railyards Boulevard. West of the Jibboom Street intersection, Railyards Boulevard would consist of one lane in each direction.

Alternative 2—Roundabout Intersection at Jibboom Street and Bercut Drive

Under Alternative 2, Railyards Boulevard would be extended west over the Sacramento River. East of Bercut Drive, Railyards Boulevard would consist of two westbound lanes and one eastbound lane. Between Jibboom Street and Bercut Drive, Railyards Boulevard would consist of a roundabout with two lanes in each direction. One westbound lane would be a trap onto northbound Jibboom Street, and one westbound lane would continue onto the new bridge. One eastbound lane would be trapped into left-turn lanes onto Bercut Drive, and one eastbound lane would continue along Railyards Boulevard. West of Jibboom Street, Railyards Boulevard would consist of one lane in each direction.

2.1.2.2 City of West Sacramento Residential Access

The new C Street alignment would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. Two alternatives are proposed for maintaining access to these parcels.

Alternative 1—C Street Connection to B Street

Alternative 1 would construct a new connection to C Street approximately 150 feet east of the 3rd Street intersection. The new access road would be 30 feet wide, extend north to B Street, and then ultimately connect to the 3rd Street/B Street intersection. This alternative would require right-of-way acquisitions from six individual parcels and removal of two structures. One structure is located on APN 010-101-010 and appears to be an individual residence. Another structure is located on APN 010-101-013 and appears to be an apartment building that supports up to four individual apartments. As B Street currently is constructed along the existing levee, the roadway improvements also would require an additional 500 feet of improvements to the levee. Similar to the improvements identified along C Street, the levee cross-section would be reconstructed to meet current design standards, which require 3:1 side slopes on the landside and waterside of the levee, with a 20-foot-wide crown at the top of the levee. The levee improvements also would include a slurry cutoff wall that extends to a depth of 110 feet below the original ground elevation.

Alternative 2—C Street Connection to 3rd Street

Alternative 2 would connect to the same location at C Street, approximately 150 feet east of the 3rd Street intersection and continue north approximately 300 feet. This alternative would then make a 90-degree left turn and connect to 3rd Street approximately 300 feet north of C Street. This alternative would require right-of-way acquisition from seven individual parcels and removal of three structures. One structure is located on APN 010-101-010 and appears to be an individual residence. Another structure is located on APN 010-101-013 and appears to be an apartment building that supports up to one individual apartment. The last structure is located on APN 010-101-004 and appears to be an individual residence.

2.2 No Build (No-Project) Alternative

Under the No Build Alternative, the existing I Street Bridge would remain in use for vehicle, bicycle, and pedestrian access between the Cities of Sacramento and West Sacramento. No changes to traffic patterns on I Street or C Street would occur. The four approach structures would remain in place and in use; and there would be no changes to existing roadways, levees or Class I bikeways.

Improvements and development of transportation infrastructure would continue following the General Plans of both cities, the Sacramento Railyards Specific Plan (approved December 2007), and the Washington Specific Plan (adopted May 1996). The Sacramento Railyards Specific Plan identifies the extension of Railyards Boulevard west to a Tee intersection at Jibboom Street. Railyards Boulevard at Bercut Drive would consist of two westbound lanes and one eastbound lane. The same number of lanes on Railyards Boulevard would extend west to the intersection with Jibboom Street; at this point, the left westbound lane on Railyards Boulevard would become a dedicated left-turn onto southbound Jibboom Street, and the right westbound lane would be a dedicated right-turn onto northbound Jibboom Street.

In West Sacramento, future changes to C Street would be based on the Washington Specific Plan, which identifies 12-foot-wide sidewalks and 7-foot-wide Class II bike lanes along the roadway. The connection to the I Street Bridge would not change.

2.3 Permits and Approvals Needed

The following permits and coordination likely will be required for the project.

Table 2-1. Permits and Approvals Needed

Agency	Permit/Approval	Status
U.S. Coast Guard	Authorization under General Bridge Act of 1946, as amended, for new bridge over navigable waters of the United States	Initiated
U.S. Army Corps of Engineers	Section 404 Clean Water Act authorization for fill of waters of the United States	Not yet initiated
National Marine Fisheries Service	Coordination regarding threatened and endangered species	Not yet initiated
U.S. Fish and Wildlife Service	Coordination regarding threatened and endangered species	Not yet initiated
California Department of Fish and Wildlife	Section 1602 Department of Fish and Game Code Streambed Alteration Agreement	Not yet initiated
Central Valley Regional Water Quality Control Board	Section 401 Water Quality Certification and coverage under the existing Caltrans National Pollutant Discharge Elimination System Permit (Order No. 00-06-DWQ)	Not yet initiated
Central Valley Flood Protection Board	Encroachment Permit	Not yet initiated
State Lands Commission	Lease of State Lands	Not yet initiated
Sacramento Area Flood Control Agency	Approval of changes to levee	Not yet initiated
West Sacramento Area Flood Control Agency	Approval of changes to levee	Not yet initiated
Sacramento Metropolitan Air Quality Management District	Formal notification prior to construction	Not yet initiated
Yolo-Solano Air Quality Management District	Formal notification prior to construction	Not yet initiated

Chapter 3 Fundamentals of Traffic Noise

This section contains a brief discussion of fundamental traffic noise concepts. For a detailed discussion, please refer to the Caltrans *Technical Noise Supplement* (TeNS) (Caltrans 2013), a technical supplement to the Protocol, which is available on the Caltrans website (<http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf>).

3.1 Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. *Noise* is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receptor, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receptor determine the sound level and characteristics of the noise perceived by the receptor. The field of acoustics deals primarily with the propagation and control of sound.

3.2 Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 and 20,000 Hz.

3.3 Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (μPa). One μPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 μPa. Because of this huge range of values, sound is rarely expressed in terms of μPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of hearing for young people is about 0 dB, which corresponds to 20 μPa.

3.4 Addition of Decibels

Because decibels are logarithmic units, SPLs cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce an SPL of 140 dB—rather, they would combine to produce an SPL of 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

3.5 A-Weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound substantially affect the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an A-weighted sound level (expressed in units of dBA [A-weighted decibels]) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments regarding the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B, C, and D scales), but these scales are rarely used in conjunction with highway traffic noise. Noise levels for traffic noise reports are typically reported in terms of dBA. Table 3-1 describes typical A-weighted noise levels for various noise sources.

Table 3-1. Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1,000 feet		
	— 100 —	
Gas lawnmower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower at 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher (next room)
Quiet urban nighttime	— 40 —	Theater; large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night; concert
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: California Department of Transportation 2013.

3.6 Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3-dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different from what is measured.

Under controlled conditions in an acoustical laboratory, the trained healthy human ear is able to discern 1-dB changes in sound levels when exposed to steady single-frequency (pure-tone) signals in the mid-frequency (1,000–to 8,000-Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy (e.g.,

doubling the volume of traffic on a highway), which would result in a 3-dB increase in sound, would generally be perceived as barely detectable.

3.7 Noise Descriptors

Noise in our daily environment fluctuates over time. Various noise descriptors have been developed to describe time-varying noise levels. The noise descriptors most commonly used in traffic noise analysis are listed below.

- **Equivalent Sound Level (Leq):** Leq represents an average of the sound energy occurring over a specified period. In effect, Leq is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level (Leq[h]) is the energy average of A-weighted sound levels occurring during a 1-hour period, and it is the basis for noise abatement criteria (NAC) used by Caltrans and FHWA.
- **Percentile-Exceeded Sound Level (Lxx):** Lxx represents the sound level exceeded for a given percentage of a specified period (e.g., L10 is the sound level exceeded 10 percent of the time, and L90 is the sound level exceeded 90 percent of the time).
- **Maximum Sound Level (Lmax):** Lmax is the highest instantaneous sound level measured during a specified period.
- **Day-Night Level (Ldn):** Ldn is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.
- **Community Noise Equivalent Level (CNEL):** Similar to Ldn, CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m., and a 5-dB penalty applied to the A-weighted sound levels occurring during evening hours between 7 p.m. and 10 p.m.

3.8 Sound Propagation

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on the factors listed below.

3.8.1 Geometric Spreading

Sound from a localized source (i.e., a *point source*) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and, hence, can be treated as a *line source*, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as

cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source.

3.8.2 Ground Absorption

The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective-wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation also has been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance.

3.8.3 Atmospheric Effects

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can experience lowered noise levels. Sound levels can be increased at large distances from the highway (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence also can cause significant effects.

3.8.4 Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls often are constructed between a source and a receptor for the specific purpose of noise reduction. A barrier that breaks the line of sight between a source and a receptor typically will result in at least 5 dB of noise reduction. Taller barriers provide increased noise reduction. Vegetation between the highway and receptor is rarely effective in reducing noise because it does not create a solid barrier.

Chapter 4 Federal Regulations and State Policies

4.1 Federal Regulations

Federal guidelines for assessing traffic noise are contained in 23 CFR 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise." These regulations constitute the federal noise standard. Projects complying with this standard are also in compliance with the requirements of NEPA.

4.1.1 Title 23 Code of Federal Regulations, Part 772

Provided in 23 CFR 772 are procedures for preparing operational and construction noise studies and for evaluating noise abatement considered for federal and federal-aid highway projects. Under 23 CFR 772.7, projects are categorized as Type I, Type II, or Type III projects. FHWA defines a Type I project as a proposed federal or federal-aid highway project for construction of a highway at a new location, the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment, or an increase in the number of through traffic lanes. A Type II project is a noise barrier retrofit project that involves no changes to highway capacity or alignment. Type III projects are projects that do not meet the classifications of either a Type I or Type II project. Type III projects do not require a noise analysis.

Type I projects include those that create a completely new noise source, as well as those that increase the volume or speed of traffic or move the traffic closer to a receptor. Type I projects include those that add an interchange, ramp, auxiliary lane, or truck-climbing lane to an existing highway or widen an existing ramp by a full lane width for its entire length. Projects that are unrelated to increased noise levels, such as striping, lighting, signing, and landscaping projects, are not considered Type I projects. The I Street Bridge Replacement Project is a Type I project.

Under 23 CFR 772.11, noise abatement must be considered for Type I projects if the project is predicted to result in a traffic noise impact. In such cases, 23 CFR 772 requires the project sponsor to consider noise abatement before adoption of the final NEPA document. This process involves identification of noise abatement measures that are reasonable, feasible, and likely to be incorporated into the project, as well as noise impacts for which no apparent solution is available.

Traffic noise impacts, as defined in 23 CFR 772.5, occur when the predicted noise level in the design year approaches or exceeds the NAC specified in 23 CFR 772, or a predicted noise level substantially exceeds the existing noise level (a substantial noise increase). However, 23 CFR 772 does not specifically define the terms *approach* or *substantial increase*; these criteria are defined in the Protocol, as described below.

Table 4-1 summarizes the NAC corresponding to various land use activity categories. Activity categories and related traffic noise impacts are determined according to actual land uses in a given area.

Table 4-1. Activity Categories and Noise Abatement Criteria

Activity Category	Noise Abatement Criteria, Hourly A-Weighted Noise Level (dBA Leq[h])[1] (Evaluation Location)	Description of Activities
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B2	67 (Exterior)	Residential.
C2	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (Exterior)	Exterior hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	N/A	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	N/A	Undeveloped lands that are not permitted.

[1] The 1-hour A weighted equivalent sound level (Leq[h]) activity criteria values are for impact determination only and are not design standards for noise abatement measures. All values are A-weighted decibels (dBA).

[2] Includes undeveloped lands permitted for this activity category.

N/A = Not applicable. There is no noise abatement criteria for this activity category.

Source: 23 CFR 772.

In identifying noise impacts, primary consideration is given to exterior areas with frequent human use. In situations where there are no exterior activities or where the exterior activities are far from the roadway or physically shielded in a manner that prevents an impact on exterior activities, the interior criterion (Activity Category D) is used as the basis for determining a noise impact.

4.2 State Regulations and Policies

4.2.1 Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects

The Protocol specifies the policies, procedures, and practices to be used by agencies that sponsor new construction or reconstruction of federal or federal-aid highway projects. The NAC specified in the Protocol are the same as those specified in 23 CFR 772. The Protocol defines a noise increase as *substantial* when the predicted noise levels with project implementation exceed existing noise levels by 12 dB. The Protocol also states that a sound level is considered to approach an NAC level when the sound level is within 1 dB of the NAC identified in 23 CFR 772 (e.g., 66 dBA is considered to approach the NAC of 67 dBA but 65 dBA is not).

The TeNS of the Protocol provides detailed technical guidance for evaluation of highway traffic noise. This includes field measurement methods, noise modeling methods, and report preparation guidance.

4.2.2 Section 216 of the California Streets and Highways Code

Section 216 of the California Streets and Highways Code relates to the noise effects of a proposed freeway project on public and private elementary and secondary schools. Under this code, a noise impact occurs if, as a result of a proposed freeway project, noise levels exceed 52 dBA Leq(h) in the interior of public or private elementary or secondary classrooms, libraries, multi-purpose rooms, or spaces. This requirement does not replace the “approach” or “exceed” NAC criterion for FHWA Activity Category D for classroom interiors, but it is a requirement that must be addressed in addition to the requirements of 23 CFR 772.

If a project results in a noise impact under this code, noise abatement must be provided to reduce classroom noise to a level that is at or below 52 dBA Leq(h). If the noise levels generated from freeway and non-freeway sources exceed 52 dBA Leq(h) prior to construction of the proposed freeway project, noise abatement must be provided to reduce the noise to the level that existed prior to construction of the project.

Chapter 5 Study Methods and Procedures

5.1 Methods for Identifying Land Uses and Selecting Noise Measurement and Modeling Receptor Locations

A field investigation was conducted to identify land uses that could be subject to traffic and construction noise impacts from the proposed project. Land uses in the project area were categorized by land use type; activity category, as defined in Table 4-1; and the extent of frequent human use. Although all developed land uses are evaluated in this analysis, as stated in the Protocol, the focus of this impact analysis is on locations of frequent human use that would benefit from a lowered noise level, such as locations with defined outdoor activity areas. For this project, the potentially affected noise-sensitive uses with defined outdoor activity areas consist of the backyards of residential land uses. The noise monitoring and modeling locations are shown in Figure 5-1.

Short-term measurement locations were selected to represent frequent outdoor use areas along the project alignment. Additionally, a long-term measurement was conducted to capture the day-night traffic noise level patterns in the project area. Short-term and long-term measurement locations also were used as noise prediction model locations. Additional locations were selected as prediction sites to characterize the noise environment at frequent outdoor use areas along the project alignment.

5.2 Field Measurement Procedures

A field noise study was conducted in accordance with recommended procedures in the TeNS. The following is a summary of the procedures that were used to collect short-term and long-term sound level data.

5.2.1 Short-Term Measurements

Short-term monitoring was conducted at five locations along the project alignment on Thursday, April 16, 2015, using a Larson Davis Model 812 Type 1 (precision-grade) sound level meter. The short-term measurement locations are identified in Figure 5-1. Short-term measurements were attended by field staff to count traffic and record observations concurrent with each measurement. The Leq values calculated by the sound level meter during each measurement period (15 minutes in duration) were logged manually on field data sheets for each measurement location. Dominant noise sources observed and other relevant measurement conditions were identified and logged manually on the field data sheets. The calibration of the meter was checked before and after the measurement, using a Larson-Davis Model CAL 200 calibrator.

Temperature, wind speed, and humidity were recorded manually during the short-term monitoring sessions using a Kestrel 3000 portable weather station. During the short-term

measurements, skies were clear, with wind speeds below 3 mph, and temperatures ranged from 79 to 86 °F.

5.2.2 Long-Term Measurements

Long-term monitoring was conducted at one location (LT-1) in the project area (Figure 5-1) using a Piccolo Type 2 sound level meter. The purpose of this measurement was to quantify the daily trend in noise levels throughout a 24-hour period and identify the peak traffic noise hour or "loudest" hour. The results of this measurement were used to describe variations in sound levels throughout the day, rather than absolute sound levels at a specific receptor of concern. The long-term sound level data were collected between Thursday, April 16 and Tuesday, April 21, 2015. Field notes are included in Appendix C.

5.3 Traffic Noise Levels Prediction Methods

Traffic noise levels were predicted using the FHWA Traffic Noise Model (TNM), Version 2.5. TNM is a computer model based on two FHWA reports: FHWA-PD-96-009 and FHWA-PD-96-010 (FHWA 1998a, 1998b). Key inputs to the traffic noise model were the locations of roadways, shielding features (e.g., topography and buildings), noise barriers, receptors, and ground type. Three-dimensional representations of these inputs were developed using CAD drawings, aerials, and topographic contours provided by the project engineer.

Raw traffic data for the project was provided by Fehr & Peers (2015). Traffic data used in the model are summarized in Appendix A.

Traffic noise was evaluated under existing (2014) conditions, design year (2040) no-build conditions, and design year build conditions. Traffic volumes from the project traffic study during the p.m. peak hour were used to model design year no-build and build traffic volumes for ramps and local streets, as p.m. peak traffic volumes were generally higher than a.m. volumes. The traffic mix of cars, medium trucks and heavy trucks were included in raw traffic data provided by Fehr & Peers. The vehicle mixes for each roadway model case are shown in Appendix A.

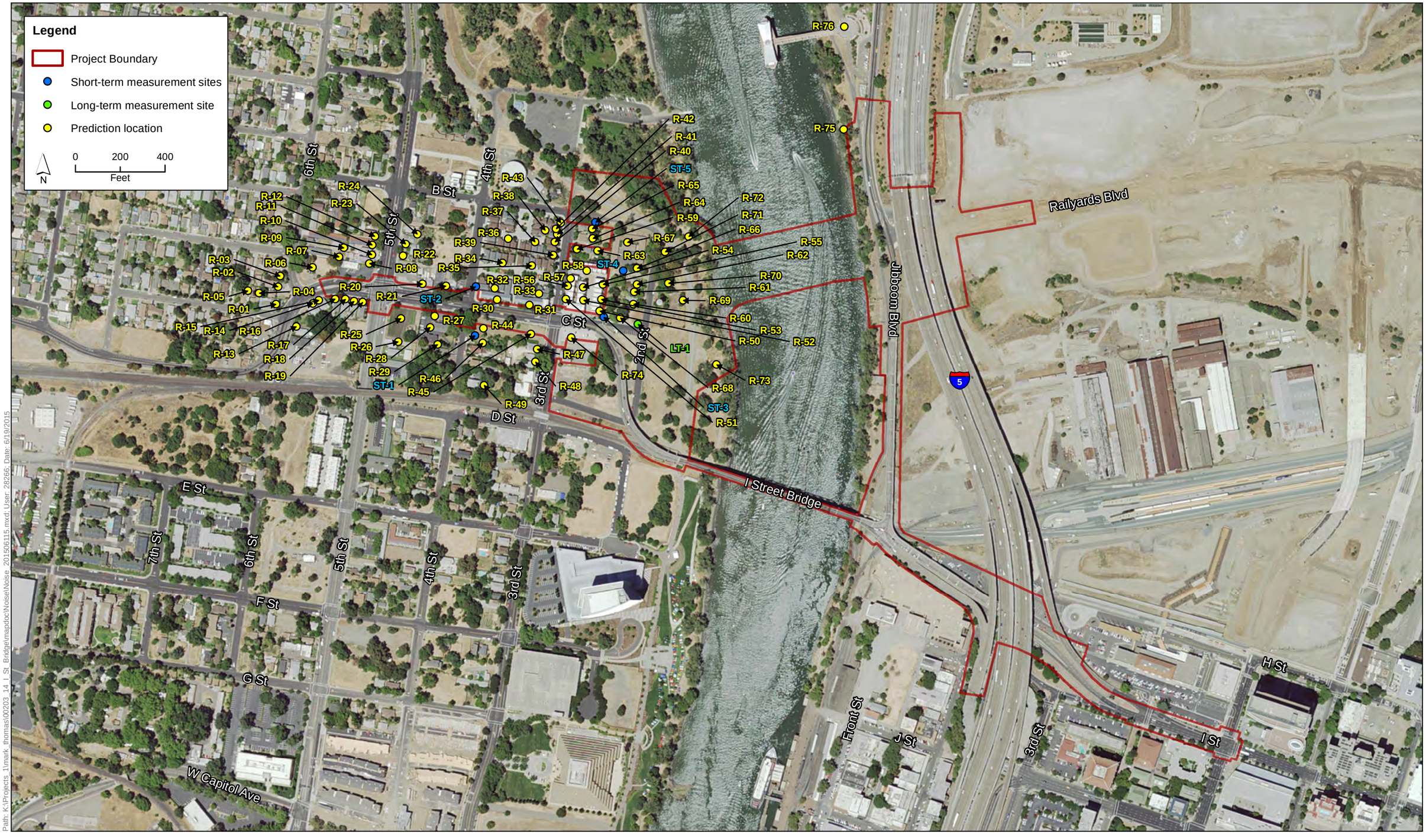

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Figure 5-1
Noise Measurement and Prediction Locations

5.4 Methods for Identifying Traffic Noise Impacts and Consideration of Abatement

Traffic noise impacts occur at receptor locations where predicted design year noise levels approach or exceed the NAC for the applicable activity category, or where substantial noise increases above existing noise levels in the build or no-build condition would occur. Where traffic noise impacts are identified, noise abatement must be considered for reasonableness and feasibility, as required by 23 CFR 772 and the Protocol.

According to the Protocol, abatement measures are considered acoustically feasible if a minimum noise reduction of 5 dB is predicted for at least one affected receptor with implementation of the abatement measures. Any receptor that is predicted to receive 5 dB or more of noise reduction from an abatement measure is identified as a "benefited" receptor. In addition, barriers should be designed to intercept the line of sight from the exhaust stack of a truck to the first tier of receptors, as stated in the Caltrans *Highway Design Manual*, Chapter 1100 (California Department of Transportation 2012). Other factors that affect feasibility include topography, access requirements for driveways and ramps, the presence of local cross streets, utility conflicts, other noise sources in the area, and safety considerations. The overall reasonableness of noise abatement is determined by the following three factors.

- The noise reduction design goal
- The cost of noise abatement
- The viewpoints of benefited receptors (including property owners and residents of the benefited receptors)

To meet the noise reduction design goal, a barrier must provide at least 7 dB of noise reduction at one or more benefited receptors. This design goal applies to any receptor and is not limited to affected receptors.

The Protocol defines the procedure for assessing reasonableness of noise barriers from a cost perspective. A cost-per-residence allowance is calculated for each benefited residence (i.e., residences that receive at least 5 dB of noise reduction from a noise barrier that provides 7 dB for at least one receptor). The 2015 allowance is $71,000 per benefited residence. Total allowances are calculated by multiplying the cost per residence by the number of benefited residences.

Chapter 6 Existing Noise Environment

6.1 Existing Land Uses

A field investigation was conducted to identify land uses that could be subject to traffic and construction noise impacts resulting from the proposed project. Single-family and multifamily residences were identified as Activity Category B land uses in the project area. Outdoor recreational uses and parks were identified as Activity Category C land uses. Several commercial (Activity Category F) and undeveloped (Activity Category G) land uses are not subject to noise impacts, as discussed in Chapter 4.

Although all land uses were evaluated in this analysis, as required by the Protocol, noise abatement was considered only for areas of frequent human use that would benefit from a lower noise level. Accordingly, the impact analysis focuses on locations with defined outdoor activity areas, such as residential backyards and common use areas at multifamily residences.

6.2 Noise Measurement Results

The existing noise environment is characterized below based on the short- and long-term noise monitoring that was conducted in the bridge replacement project area.

6.2.1 Short-Term Measurements

Results of short-term noise monitoring are shown in Table 6-1 in terms of measured Leq and traffic data collected concurrently with each measurement. Counted traffic volumes were normalized to 1 hour for calibration purposes, and vehicles classified according to TNM vehicle categories (automobiles, medium trucks, heavy trucks). Traffic noise was observed to be the dominant ambient noise source at all sites. Short-term monitoring locations are shown in Figure 5-1.

Short-term noise measurements and respective traffic counts were conducted to characterize the noise environment adjacent to the project study area and to validate the accuracy of the TNM model calculations using traffic counted concurrently with measurements. Vehicle speeds were estimated by driving a test car concurrently with traffic on roadways where counts were conducted.

Table 6-1. Summary of Short-Term Measurements

Receptor	Address	Land Uses/ Activity Category	Start Date/ Time	Duration (minutes)	Leq
ST-1	4th Street & C Street	Undeveloped / G	4/16/15 1:44	15	57.0
ST-2	281 4th Street	Residential / B	4/16/15 11:25	15	58.7
ST-3	Vacant lot, 2nd Street	Undeveloped / G	4/16/15 11:50	15	59.4
ST-4	212 2nd Street	Residential / B	4/16/15 2:38	15	50.3
ST-5	End of B Street	Residential / B	4/16/15 2:11	15	51.1

Leq = equivalent sound level

6.2.2 Long-Term Measurements

Long-term monitoring was conducted at one location. The purpose of the long-term noise measurement was to determine the changes in noise levels within the project area throughout a typical day. The data are presented for documentation purposes and are not used in the prediction analysis. Long-term sound level data were collected for 1 full day on April 20, 2015.

Long-term monitoring site LT-1 (shown in Figure 5-1) was mounted on a utility pole at the corner of C Street and 2nd Street. The worst-hour noise level measured was 67.6 dBA Leq(h) during the 7:00 a.m. hour. Hourly noise levels and offsets between the worst-hour noise and each of the 24 hours of the measurement period are shown in Table 6-2.

Table 6-2. Summary of Long-Term Measurements at Location LT-1: C Street

Date	Time (hour beginning)	1-Hour Leq (dBA)	Difference from Worst-Hour Noise (dB)
April 20, 2015	0:00:00	58	-9.6
	1:00:00	59 [1]	-8.6
	2:00:00	57.3	-10.3
	3:00:00	56.5	-11.1
	4:00:00	59.5	-8.1
	5:00:00	65.2	-2.4
	6:00:00	65.6	-2
	7:00:00	**67.6**	**0**
	8:00:00	66.6	-1
	9:00:00	65.8	-1.8
	10:00:00	64.4	-3.2
	11:00:00	59.3	-8.3
	12:00:00	67.1	-0.5
	13:00:00	58.7	-8.9
	14:00:00	61.5	-6.1
	15:00:00	66.3	-1.3
	16:00:00	63.6	-4
	17:00:00	63.8	-3.8
	18:00:00	63.9	-3.7
	19:00:00	62.3	-5.3
	20:00:00	63.9	-3.7

Date	Time (hour beginning)	1-Hour Leq (dBA)	Difference from Worst-Hour Noise (dB)
	21:00:00	66.6	-1
	22:00:00	68.6	-2.6
	23:00:00	64.3	-3.3
Maximum		67.6	
Minimum		56.5	

Note: Worst-hour noise is **bolded**.
dBA Leq[h] = A-weighted equivalent sound level; dB = decibels
[1] Adjusted noise level due to an impulsive noise event not typical of ambient levels.

6.2.3 Traffic Noise Model Calibration

TNM was used to compare measured traffic noise levels to modeled noise levels at field measurement locations, using traffic count data collected at the time of the noise measurements. At measurement locations where modeled existing sound level values differed from measured values by more than 3 dB, calibration factors (K-factors) were used to adjust modeled noise levels at those locations and at nearby prediction locations.

K-factors and a comparison between measured and modeled noise levels at each measurement location are shown in Table 6-3. Two of the short-term measurements were measurements of background ambient levels in the neighborhood, which included distant traffic noise, but these were not used to calibrate the model. Two short-term measurements were within 3 dB of model prediction values. One short-term measurement location was 3.7 dB below measured levels. A K-factor of plus-4 dB (+4 dB) was applied to existing and future models at these locations, as well as at nearby receivers. After applying the K-factors, noise levels at all measurement sites were in close agreement with measured levels.

Table 6-3. Comparison of Measured with Modeled Worst-Hour Noise Sound Levels

Measurement Location	Measured Existing Sound Level (dBA)	Modeled Existing Sound Level (dBA)	Measured Minus Modeled (dB)	K-Factor Used (dB)
ST-1	57.0	56.0	- 1.0	--
ST-2	58.7	56.7	- 2.0	--
ST-3	59.4	55.7	- 3.7	+ 4.0
ST-4	50.3	-- [1]	-- [1]	-- [1]
ST-5	51.1	-- [1]	-- [1]	-- [1]

dBA = A weighted decibels; dB = decibels
[1] Ambient measurement only, not calibrated in TNM.

6.2.4 Existing Modeled Noise Levels

Predicted traffic noise levels under existing conditions are shown in Appendix B. As shown in Table B-1, existing worst-hour traffic noise levels range from 46 to 71 dBA Leq(h). Traffic on I-5 and C Street are the dominant noise sources in the study area.

Chapter 7 Future Noise Environment, Impacts, and Considered Abatement

7.1 Future Noise Environment and Impacts

Traffic noise modeling results for existing conditions and design year (2040) conditions with and without the project under the various alternative conditions are summarized in Tables B-1 through B-4 (see Appendix B).

- Table B-1: 2nd Street Alternative 1 and I Street Roundabout
- Table B-2: 2nd Street Alternative 1 and I Street Signalized Intersection
- Table B-3: 2nd Street Alternative 2 and I Street Roundabout
- Table B-4: 2nd Street Alternative 2 and I Street Signalized Intersection

Predicted design year build condition traffic noise levels are compared with existing conditions and design year no-build conditions. The comparison with existing conditions is included in the analysis to identify traffic noise impacts according to 23 CFR 772. The comparison to without-project conditions indicates the direct effect of the project. As stated in the TeNS, modeling results are rounded to the nearest decibel.

As shown in Table B-1, traffic noise levels for design year no-build conditions range from 49 to 73 dBA Leq(h). Under design year build conditions, predicted traffic noise levels range from 49 to 74 dBA Leq(h). This range of noise levels applies to both design options for 2nd Street and the I Street/I-5 interchange. Traffic noise levels would approach or exceed the NAC for residential uses (Activity Category B) and park uses (Activity Category C).

Because traffic noise impacts are predicted to occur at Activity Category B and Activity Category C land uses in the project area, noise abatement must be considered.

7.2 Preliminary Noise Abatement Analysis

According to 23 CFR 772(13)(c), federal funding may be used for the following abatement measures.

- Construction of noise barriers, including acquisition of property rights, either within or outside the highway right-of-way. Landscaping is not a viable noise abatement measure.
- Traffic management measures including, but not limited to, traffic control devices and signage for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations.
- Alteration of horizontal and vertical alignments.

- Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development that would be adversely affected by traffic noise.
- Noise insulation of Activity Category D land use facilities. Post-installation maintenance and operational costs for noise insulation are not eligible for federal-aid funding.

Among these options, noise barriers are the only feasible abatement measure for the proposed project. Noise barriers are evaluated for feasibility based on achievable noise reduction. For each noise barrier found to be acoustically feasible, reasonable cost allowances were calculated. For any noise barrier to be considered reasonable from a cost perspective, the estimated cost of the noise barrier should be equal to or less than the total cost allowance calculated for the barrier. The cost calculations of the noise barrier should include all items appropriate and necessary for construction of the barrier, such as traffic control, drainage modification, and retaining walls.

The following is a discussion of noise abatement evaluated for the project. The discussion applies to all design options for 2nd Street and the I Street/I-5 interchange. Locations of evaluated noise-sensitive receivers are shown in Figure 5-1.

7.2.1 West of 6th Street, between California Street and Elizabeth Street

The traffic noise modeling results in Appendix B indicate that noise levels of up to 68 dBA Leq(h) are predicted at four residential outdoor use areas located along this segment of the project. This traffic noise level exceeds the NAC for residential use (Activity Category B). Therefore, traffic noise impacts are predicted to occur at this location and noise abatement must be considered. Traffic noise levels would increase by up to 4 dB relative to existing conditions, which would not result in a substantial increase in noise levels.

A noise barrier would not be feasible along 6th Street due to driveway access requirements to residences in this area. Therefore, a noise barrier was not considered further.

7.2.2 North of C Street, between 6th Street and 5th Street

The traffic noise modeling results in Appendix B indicate that noise levels of up to 67 dBA Leq(h) are predicted at one residential outdoor use area located along this segment of the project. This traffic noise level exceeds the NAC for residential use (Activity Category B). Therefore, traffic noise impacts are predicted to occur at this location and noise abatement must be considered. Traffic noise levels would increase by up to 5 dB relative to existing conditions, which would not result in a substantial increase in noise levels.

A noise barrier would not be feasible along C Street due to driveway access requirements to residences in this area. Therefore, a noise barrier was not considered further.

7.2.3 East of 6th Street/C Street, between California Street and 5th Street

The traffic noise modeling results in Appendix B indicate that noise levels of up to 72 dBA Leq(h) are predicted at seven residential outdoor use areas located along this segment of the project. This traffic noise level exceeds the NAC for residential use (Activity Category B). Therefore, traffic noise impacts are predicted to occur at this location and noise abatement must be considered. Traffic noise levels would increase by up to 5 dB relative to existing conditions, which would not result in a substantial increase in noise levels.

A noise barrier would not be feasible along 6th Street/C Street due to driveway access requirements to residences in this area. Therefore, a noise barrier was not considered further.

7.2.4 South of C Street, between 5th Street and 4th Street

The traffic noise modeling results in Appendix B indicate that noise levels of up to 71 dBA Leq(h) are predicted at eight multifamily residential units located along this segment of the project. This traffic noise level exceeds the NAC for residential use (Activity Category B). Therefore, traffic noise impacts are predicted to occur at this location and noise abatement must be considered. Traffic noise levels would increase by up to 5 dB relative to existing conditions, which would not result in a substantial increase in noise levels.

There are no outdoor areas of frequent human use that would benefit from a lowered noise level at the apartment units. Furthermore, a noise barrier would not be feasible along C Street because the façade of the apartment building is adjacent to a public sidewalk. Therefore, a noise barrier was not considered further.

7.2.5 North of C Street, between 4th Street and 3rd Street

The traffic noise modeling results in Appendix B indicate that noise levels of up to 70 dBA Leq(h) are predicted at eight multifamily townhouse units located along this segment of the project. This traffic noise level exceeds the NAC for residential use (Activity Category B). Therefore, traffic noise impacts are predicted to occur at this location and noise abatement must be considered. Traffic noise levels would increase by up to 4 dB relative to existing conditions, which would not result in a substantial increase in noise levels.

There are no common outdoor areas of frequent human use facing C Street that would benefit from a lowered noise level at the townhouse units. Furthermore, a noise barrier would not be feasible along C Street because the façade of the building is adjacent to a public sidewalk. Therefore, a noise barrier was not considered further.

7.2.6 South of C Street, between 4th Street and 3rd Street

The traffic noise modeling results in Appendix B indicate that noise levels of up to 66 dBA Leq(h) are predicted at one residential outdoor use area located along this segment of the

project. This traffic noise level exceeds the NAC for residential use (Activity Category B). Therefore, traffic noise impacts are predicted to occur at this location and noise abatement must be considered. Traffic noise levels would increase by up to 4 dB relative to existing conditions, which would not result in a substantial increase in noise levels.

A noise barrier would not be feasible along C Street or 3rd Street due to driveway access requirements to residences in this area. Therefore, a noise barrier was not considered further.

7.2.7 North of C Street, between 3rd Street and 2nd Street

The traffic noise modeling results in Appendix B indicate that noise levels of up to 69 dBA Leq(h) are predicted at two multifamily townhouse units located along this segment of the project. This traffic noise level exceeds the NAC for residential use (Activity Category B). Therefore, traffic noise impacts are predicted to occur at this location and noise abatement must be considered. Traffic noise levels would increase by up to 4 dB relative to existing conditions, which would not result in a substantial increase in noise levels.

The individual townhouse units have balconies that face east toward the future I Street Bridge alignment, however, there are no common outdoor areas of frequent human use facing C Street that would benefit from a lowered noise level. Under the 2nd Street Design Alternative 1, a noise barrier would not be feasible along C Street because the façade of the building is adjacent to a public sidewalk. Under the 2nd Street Design Alternative 2, a noise barrier would not be feasible because of access requirements to the realigned 2nd Street, which would pass along the eastern façade of the townhouse units. Therefore, a noise barrier was not considered further.

7.2.8 Matsui Waterfront Park, Jibboom Street

The traffic noise modeling results in Appendix B indicate that noise levels of up to 73 dBA Leq(h) are predicted at recreational outdoor and park uses at Matsui Waterfront Park located along this segment of the project. This traffic noise level exceeds the NAC for outdoor recreational use (Activity Category C). Therefore, traffic noise impacts are predicted to occur at this location and noise abatement must be considered. Traffic noise levels would increase by up to 2 dB relative to existing conditions, which would not result in a substantial increase in noise levels.

A noise barrier would not be feasible along Jibboom Street due to roadway access requirements to parking lots at Matsui Waterfront Park. Furthermore, I-5 is a significant source of traffic noise in this area. For noise abatement measures to be effective, they would need to be designed to reduce noise from traffic on I-5, and improvements to I-5 are not included in the project. Therefore, a noise barrier was not considered further.

Chapter 8 Construction Noise

During construction of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Construction noise is regulated by provisions in Section 14-8.02, "Noise Control," of the Caltrans *Standard Specifications* which states the following.

- Do not exceed 86 dBA Lmax at 50 feet from the job site activities from 9 p.m. to 6 a.m.
- Equip an internal combustion engine with the manufacturer-recommended muffler. Do not operate an internal combustion engine on the job site without the appropriate muffler.

Two types of short-term noise impacts would occur during project construction. The first type would be from construction crew commutes and the transport of construction equipment and materials to the project site, which would incrementally raise noise levels on access roads leading to the site. The pieces of heavy equipment for grading and construction activities would be moved onsite, would remain for the duration of each construction phase, and would not add to the daily traffic volume in the project vicinity. A high single-event noise exposure potential at a maximum level of 87 dBA Lmax from trucks passing at 50 feet would exist. However, the projected construction traffic would be minimal when compared to existing traffic volumes on other affected streets, and the associated long-term noise level change would not be perceptible. Therefore, construction-related worker commutes and equipment transport noise impacts would be short term and would not be adverse.

The second type of short-term noise impact would be from construction activities. Construction is performed in distinct steps, each of which has its own mix of equipment and consequently its own noise characteristics. These various sequential phases would change the character of the noise generated and the noise levels along the project alignment as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 8-1 lists typical construction equipment noise levels (Lmax) recommended for noise impact assessments, based on a distance of 50 feet between the equipment and a noise receptor.

Typical noise levels at 50 feet from an active construction area range up to 91 dBA Lmax during the noisiest construction phases. The site preparation phase, which includes grading and paving, tends to generate the highest noise levels because the noisiest construction equipment is earthmoving equipment. Earthmoving equipment includes excavation machinery such as backfillers, bulldozers, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

Table 8-1. Typical Construction Equipment Noise Levels

Type of Equipment	Range of Maximum Sound Levels (dBA Lmax at 50 feet)	Suggested Maximum Sound Levels for Analysis (dBA Lmax at 50 feet)
Pile drivers	81 to 96	93
Rock drills	83 to 99	96
Jackhammers	75 to 85	82
Pneumatic tools	78 to 88	85
Pumps	74 to 84	80
Scrapers	83 to 91	87
Haul trucks	83 to 94	88
Cranes	79 to 86	82
Portable generators	71 to 87	80
Rollers	75 to 82	80
Dozers	77 to 90	85
Tractors	77 to 82	80
Front-end loaders	77 to 90	86
Hydraulic backhoe	81 to 90	86
Hydraulic excavators	81 to 90	86
Graders	79 to 89	86
Air compressors	76 to 89	86
Trucks	81 to 87	86

dBA = A-weighted decibels; Lmax = maximum instantaneous noise level
Source: Bolt, Beranek & Newman 1987

In addition to standard construction equipment, bridge construction would require the use of pile drivers. As shown in Table 8-1, pile-driving generates noise levels of up to 96 dBA Lmax at 50 feet.

Construction of the proposed project is expected to require the use of pile drivers, earthmovers, bulldozers, paving machines, water trucks, dump trucks, concrete trucks, rollers, and pickup trucks. Noise associated with the use of construction equipment is estimated between 79 and 89 dBA Lmax at a distance of 50 feet from the active construction area for the grading phase. As seen in Table 8-1, the maximum noise level generated by each earthmover is assumed to be approximately 86 dBA Lmax at 50 feet from the earthmover in operation. Each bulldozer would generate approximately 85 dBA Lmax at 50 feet. The maximum noise level generated by water trucks and pickup trucks is approximately 86 dBA Lmax at 50 feet from these vehicles. Each doubling of the sound source with equal strength increases the noise level by 3 dBA.

Each piece of construction equipment operates as an individual point source. The worst-case composite noise level at the nearest residence during this phase of construction would be 91 dBA Lmax (at a distance of 50 feet from an active construction area).

No adverse noise impacts from construction are anticipated because construction would be conducted in accordance with provisions in Section 14-8.02, “Noise Control,” of the *Caltrans Standard Specifications* and applicable local noise standards. Construction noise would be short term, intermittent, and typically overshadowed by local traffic noise.

Chapter 9 References

Bolt, Beranek & Newman. 1987. *Noise Control for Buildings and Manufacturing Plants.*

California Department of Transportation. 2002. *Distance Limits for Traffic Noise Prediction Models*. (Technical Advisory, Noise TAN-02-02.) Publications Unit. Sacramento, CA.

———. 2010. *Standard Specifications*. Publications Unit.

———. 2011. *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects.* August. Sacramento, CA.

———. 2012. *Highway Design Manual*. Publications Unit.

———. 2013. *Technical Noise Supplement to the Traffic Noise Analysis Protocol.* September. Sacramento, CA: Division of Environmental Analysis. Available: <http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf>. Accessed: July 2, 2014.

Fehr & Peers. 2015. Raw "cube" Traffic Data. Prepared for City of Sacramento. Roseville, CA. September.

Federal Highway Administration. (Anderson, Grant S., Cynthia S. Y. Lee, Gregg G. Fleming). 1998a. *FHWA Traffic Noise Model, Version 1.0: User's Guide. Report No. FHWA-PD-96-009 and DOT-VNTSC-FHWA-98-1*. Cambridge, MA: John A. Volpe National Transportation Systems Center, Acoustics Facility. January.

———. (Menge, Christopher W., Christopher J. Rossano, Grant S. Anderson, Christopher J. Bajdek). 1998b. *FHWA Traffic Noise Model, Version 1.0: Technical Manual. Report No. FHWA-PD-96-010 and DOT-VNTSC-FHWA-98-2*. Cambridge, MA: John A. Volpe National Transportation Systems Center, Acoustics Facility. February.

Chapter 10 NSR Preparer's Qualifications

Jason Volk has 13 years of experience in the analysis of transportation noise and has prepared numerous noise study reports for several state transportation departments, especially for Caltrans and the Virginia Department of Transportation. He has taught several courses on the use of the FHWA TNM for state transportation department staff in Massachusetts, New York, Texas, and California. He is a member of the Institute of Noise Control Engineering and Transportation Research Board.

Appendix A Traffic Data

This appendix contains tables of traffic data for existing conditions, design year conditions without the project, and design year conditions with the project.

Table A-1. Existing Peak Hour Traffic Volumes

Roadway	Segment	Number of Lanes	Total Volume PM Peak Hour Volume	Auto		Medium Trucks		Heavy Trucks		Speed
				%	Volume	%	Volume	%	Volume	(A/HT)
C Street WB	Between 6th St and I Street Bridge	2	1,294	84%	1,088	15%	196	1%	10	30/30/30
C Street EB	Between 6th St and I Street Bridge	2	1,270	84%	1,063	16%	197	1%	10	30/30/30
2nd Street NB	north of C Street	1	16	88%	14	13%	2	0%	0	20/20
2nd Street SB	north of C Street	1	16	88%	14	13%	2	0%	0	20/20
2nd Street	south of C Street	2	32	88%	28	13%	4	0%	0	20/20
3rd Street	north of C Street	2	50	90%	45	10%	5	0%	0	15/15
3rd Street	south of C Street	2	591	79%	467	19%	115	2%	9	20/20/20
4th Street	north of C Street	2	31	94%	29	6%	2	0%	0	15/15
4th Street	south of C Street	2	47	91%	43	9%	4	0%	0	20/20
5th Street	north of C Street	2	1,056	91%	960	9%	95	0%	1	25/25/25
5th Street	south of C Street	2	1,644	87%	1,431	12%	203	1%	10	25/25/25
Jibboom Street	north of I Street	2	1,888	83%	1,565	16%	305	1%	18	25/25/25
I-5 NB Lanes 1&2	Between I Street and Richards Blvd	2	6,134	69%	4,221	23%	1,420	8%	493	60/60/60
I-5 NB Lanes 3&4	Between I Street and Richards Blvd	2	6,134	69%	4,221	23%	1,420	8%	493	60/60/60
I-5 SB Lanes 3&4	Between I Street and Richards Blvd	2	5,553	72%	4,006	19%	1,073	9%	474	60/60/60
I-5 SB Lanes 1&2	Between I Street and Richards Blvd	2	5,553	72%	4,006	19%	1,073	9%	474	60/60/60

Table A-2. Future No Build Peak Hour Traffic Volumes

Roadway	Segment	Number of Lanes	Total Volume PM Peak Hour Volume	Auto		Medium Trucks		Heavy Trucks		Speed
				%	Volume	%	Volume	%	Volume	(A/HT)
C Street WB	Between 6th St and I Street Bridge	2	1,294	84%	1,088	15%	196	1%	10	30/30/30
C Street EB	Between 6th St and I Street Bridge	2	1,270	84%	1,063	16%	197	1%	10	30/30/30
2nd Street NB	north of C Street	1	16	88%	14	13%	2	0%	0	20/20
2nd Street SB	north of C Street	1	16	88%	14	13%	2	0%	0	20/20
2nd Street	south of C Street	2	32	88%	28	13%	4	0%	0	20/20
3rd Street	north of C Street	2	50	90%	45	10%	5	0%	0	15/15
3rd Street	south of C Street	2	591	79%	467	19%	115	2%	9	20/20/20
4th Street	north of C Street	2	31	94%	29	6%	2	0%	0	15/15
4th Street	south of C Street	2	47	91%	43	9%	4	0%	0	20/20
5th Street	north of C Street	2	1,056	91%	960	9%	95	0%	1	25/25/25
5th Street	south of C Street	2	1,644	87%	1,431	12%	203	1%	10	25/25/25
Jibboom Street	north of I Street	2	1,888	83%	1,565	16%	305	1%	18	25/25/25
I-5 NB Lanes 1&2	Between I Street and Richards Blvd	2	6,134	69%	4,221	23%	1,420	8%	493	60/60/60
I-5 NB Lanes 3&4	Between I Street and Richards Blvd	2	6,134	69%	4,221	23%	1,420	8%	493	60/60/60
I-5 SB Lanes 3&4	Between I Street and Richards Blvd	2	5,553	72%	4,006	19%	1,073	9%	474	60/60/60
I-5 SB Lanes 1&2	Between I Street and Richards Blvd	2	5,553	72%	4,006	19%	1,073	9%	474	60/60/60

Table A-3. Future Build Alt. 1 & 2 Peak Hour Traffic Volumes

Roadway	Segment	Number of Lanes	Total Volume PM Peak Hour Volume	Auto		Medium Trucks		Heavy Trucks		Speed
				%	Volume	%	Volume	%	Volume	(A/HT)
I Street Bridge EB	west of I-5	2	1,612	82%	1,329	16%	265	1%	18	30/30/30
I Street Bridge WB	west of I-5	2	1,649	83%	1,369	16%	262	1%	18	30/30/30
2nd Street EB (New Align.)	north of C Street	1	45	91%	41	9%	4	0%	0	15/15
2nd Street WB (New Align.)	north of C Street	1	45	91%	41	9%	4	0%	0	15/15
2nd Street	north of C Street	2	45	91%	41	9%	4	0%	0	15/15
2nd Street	south of C Street	1	45	91%	41	9%	4	0%	0	15/15
3rd Street	north of C Street	2	45	91%	41	9%	4	0%	0	15/15
3rd Street	south of C Street	2	866	80%	689	19%	164	2%	13	20/20/20
4th Street	north of C Street	2	32	94%	30	6%	2	0%	0	15/15
4th Street	south of C Street	2	46	91%	42	9%	4	0%	0	20/20
5th Street	north of C Street	2	1,077	91%	978	9%	98	0%	1	25/25/25
5th Street	south of C Street	2	2,149	85%	1,821	14%	306	1%	22	25/25/25
Bercut Drive	north of I Street	2	649	80%	516	20%	128	1%	5	25/25/25
Jibboom Street	north of I Street	3	725	82%	598	16%	117	1%	10	25/25/25
Jibboom Street	south of I Street	2	70	87%	61	13%	9	0%	0	25/25
I-5 NB Lanes 1&2	Between I Street and Richards Blvd	2	6,069	69%	4,179	23%	1,407	8%	483	60/60/60
I-5 NB Lanes 3-5	Between I Street and Richards Blvd	3	6,069	69%	4,179	23%	1,407	8%	483	60/60/60
I-5 SB Lanes 1&2	Between I Street and Richards Blvd	2	5,793	69%	3,992	23%	1,327	8%	474	60/60/60
I-5 SB Lanes 3-5	Between I Street and Richards Blvd	3	5,793	69%	3,992	23%	1,327	8%	474	60/60/60

Appendix B Predicted Existing and Future Noise Levels

Tables B-1 through B-4 summarize the traffic noise modeling results for existing and design year (2040) conditions with and without the project, for 2nd Street design options Alternatives 1 and 2, and for I Street interchange roundabout and signalized options.

Table B-1. Impact Assessment and Predicted Noise Levels, 2nd Street ALT 1 and I Street Roundabout

Receiver I.D.	Land Use / Activity Category	Location	Existing Noise Level $L_{eq}(h)$, dBA	Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA						
				Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)
R-01	Residential / B	California Street	64	67	68	3	1	4	B	A/E
R-02	Residential / B	6th Street	62	65	67	3	2	5	B	A/E
R-03	Residential / B	6th Street	61	64	65	3	1	4	B	None
R-04	Residential / B	California Street	56	59	60	3	1	4	B	None
R-05	Residential / B	California Street	52	55	56	3	1	4	B	None
R-06	Residential / B	6th Street	60	63	64	3	1	4	B	None
R-07	Residential / B	6th Street	60	63	65	3	2	5	B	None
R-08	Residential / B	5th Street	62	66	67	4	1	5	B	A/E
R-09	Residential / B	6th Street	56	59	60	3	1	4	B	None
R-10	Residential / B	5th Street	60	64	65	4	1	5	B	None
R-11	Residential / B	5th Street	60	64	64	4	0	4	B	None
R-12	Undeveloped / G	5th Street	60	64	64	4	0	4	G	None
R-13	Residential / B	6th Street	66	69	71	3	2	5	B	A/E
R-14	Residential / B	C Street	67	70	72	3	2	5	B	A/E
R-15	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-16	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-17	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-18	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-19	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-20	Commerical / F	5th Street	65	68	69	3	1	4	F	None
R-21	Commerical / F	C Street	64	67	68	3	1	4	F	None
R-22	Residential / B	5th Street	58	62	63	4	1	5	B	None
R-23	Residential / B	5th Street	58	62	62	4	0	4	B	None
R-24	Residential / B	5th Street	55	57	58	2	1	3	B	None
R-25	Undeveloped / G	5th Street	64	67	69	3	2	5	G	None
R-26	Residential / B	5th Street	61	64	65	3	1	4	B	None
R-27	Residential / B	4th Street	66	69	71	3	2	5	B	A/E
R-28	Residential / B	4th Street	62	65	67	3	2	5	B	A/E
R-29	Residential / B	4th Street	59	62	63	3	1	4	B	None
R-30	Residential / B	C Street	66	70	70	4	0	4	B	A/E
R-31	Residential / B	C Street	66	69	70	3	1	4	B	A/E
R-32	Residential / B	4th Street	56	59	59	3	0	3	B	None
R-33	Residential / B	4th Street	55	58	59	3	1	4	B	None
R-34	Residential / B	Metro Lane	54	56	57	2	1	3	B	None
R-35	Residential / B	Metro Lane	56	58	57	2	-1	1	B	None
R-36	Residential / B	B Street	52	53	54	1	1	2	B	None
R-37	Residential / B	B Street	53	54	55	1	1	2	B	None

Receiver I.D.	Land Use / Activity Category	Location	Existing Noise Level $L_{eq}(h)$, dBA	Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA						
				Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)
R-38	Residential / B	B Street	47	49	49	2	0	2	B	None
R-39	Residential / B	B Street	59	61	61	2	0	2	B	None
R-40	Residential / B	B Street	59	61	61	2	0	2	B	None
R-41	Residential / B	B Street	59	60	61	1	1	2	B	None
R-42	Residential / B	B Street	59	60	61	1	1	2	B	None
R-43	Residential / B	B Street	59	60	61	1	1	2	B	None
R-44	Undeveloped / G	4th Street	64	67	69	3	2	5	G	None
R-45	Undeveloped / G	3rd Street	65	68	69	3	1	4	G	None
R-46	Residential / B	4th Street	61	64	65	3	1	4	B	None
R-47	Residential / B	3rd Street	62	65	66	3	1	4	B	A/E
R-48	Residential / B	3rd Street	60	63	64	3	1	4	B	None
R-49	Residential / B	4th Street	57	60	60	3	0	3	B	None
R-50	Residential / B	3rd Street	65	68	69	3	1	4	B	A/E
R-51	Residential / B	3rd Street	62	65	66	3	1	4	B	A/E
R-52	Residential / B	3rd Street	58	61	60	3	-1	2	B	None
R-53	Residential / B	3rd Street	57	60	61	3	1	4	B	None
R-54	Residential / B	3rd Street	56	58	58	2	0	2	B	None
R-55	Residential / B	3rd Street	53	56	57	3	1	4	B	None
R-56	Residential / B	3rd Street	57	60	61	3	1	4	B	None
R-57	Residential / B	3rd Street	55	58	58	3	0	3	B	None
R-58	Residential / B	3rd Street	57	58	59	1	1	2	B	None
R-59	Residential / B	3rd Street	59	60	62	1	2	3	B	None
R-60	Residential / B	2nd Street	61	63	65	2	3	4	B	None
R-61	Residential / B	2nd Street	60	62	65	2	3	5	B	None
R-62	Residential / B	2nd Street	60	61	64	1	3	4	B	None
R-63	Residential / B	3rd Street	60	61	62	1	1	2	B	None
R-64	Residential / B	3rd Street	59	60	61	1	1	2	B	None
R-65	Residential / B	3rd Street	58	59	61	1	2	3	B	None
R-66	Residential / B	2nd Street	59	61	63	2	2	4	B	None
R-67	Residential / B	2nd Street	58	59	61	1	2	3	B	None
R-68	Undeveloped / G	2nd Street	62	64	69	2	5	7	G	None
R-69	Undeveloped / G	2nd Street	56	57	66	1	9	10	G	None
R-70	Undeveloped / G	2nd Street	55	57	62	2	5	7	G	None
R-71	Undeveloped / G	2nd Street	55	57	60	2	3	5	G	None
R-72	Undeveloped / G	2nd Street	66	67	68	1	1	2	G	None
R-73	Undeveloped / G	2nd Street	65	66	67	1	1	2	G	None
R-74	Commerical / F	C Street	66	69	70	3	1	4	F	None
R-75	Undeveloped / G	Jiboom Street	71	73	73	2	0	2	G	None

Receiver I.D.	Land Use / Activity Category	Location	Existing Noise Level $L_{eq}(h)$, dBA	Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA						
				Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)
R-76	Park / C	Matsui Waterfront Park	71	73	73	2	0	2	C	None
ST-1	Undeveloped / G	4th Street	69	70	74	1	4	5	G	None
ST-2	Residential / B	4th Street	69	70	73	1	3	4	B	A/E
ST-3	Undeveloped / G	C Street	63	64	70	1	6	7	G	None
ST-4	Residential / B	2nd Street	63	64	69	1	5	6	B	A/E
ST-5	Residential / B	B Street	60	61	68	1	7	8	B	A/E

Notes:
A/E= Future noise conditions approach or exceed the Noise Abatement Criteria.

Table B-2. Impact Assessment and Predicted Noise Levels, 2nd Street ALT 1 and I Street Signalized Intersection

Receiver I.D.	Land Use / Activity Category	Location	Existing Noise Level $L_{eq}(h)$, dBA	Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA						
				Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)
R-01	Residential / B	California Street	64	67	68	3	1	4	B	A/E
R-02	Residential / B	6th Street	62	65	67	3	2	5	B	A/E
R-03	Residential / B	6th Street	61	64	65	3	1	4	B	None
R-04	Residential / B	California Street	56	59	60	3	1	4	B	None
R-05	Residential / B	California Street	52	55	56	3	1	4	B	None
R-06	Residential / B	6th Street	60	63	64	3	1	4	B	None
R-07	Residential / B	6th Street	60	63	65	3	2	5	B	None
R-08	Residential / B	5th Street	62	66	67	4	1	5	B	A/E
R-09	Residential / B	6th Street	56	59	60	3	1	4	B	None
R-10	Residential / B	5th Street	60	64	65	4	1	5	B	None
R-11	Residential / B	5th Street	60	64	64	4	0	4	B	None
R-12	Undeveloped / G	5th Street	60	64	64	4	0	4	G	None
R-13	Residential / B	6th Street	66	69	71	3	2	5	B	A/E
R-14	Residential / B	C Street	67	70	72	3	2	5	B	A/E
R-15	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-16	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-17	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-18	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-19	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-20	Commerical / F	5th Street	65	68	69	3	1	4	F	None
R-21	Commerical / F	C Street	64	67	68	3	1	4	F	None
R-22	Residential / B	5th Street	58	62	63	4	1	5	B	None
R-23	Residential / B	5th Street	58	62	62	4	0	4	B	None
R-24	Residential / B	5th Street	55	57	58	2	1	3	B	None
R-25	Undeveloped / G	5th Street	64	67	69	3	2	5	G	None
R-26	Residential / B	5th Street	61	64	65	3	1	4	B	None
R-27	Residential / B	4th Street	66	69	71	3	2	5	B	A/E
R-28	Residential / B	4th Street	62	65	67	3	2	5	B	A/E
R-29	Residential / B	4th Street	59	62	63	3	1	4	B	None
R-30	Residential / B	C Street	66	70	70	4	0	4	B	A/E
R-31	Residential / B	C Street	66	69	70	3	1	4	B	A/E
R-32	Residential / B	4th Street	56	59	59	3	0	3	B	None
R-33	Residential / B	4th Street	55	58	59	3	1	4	B	None
R-34	Residential / B	Metro Lane	54	56	57	2	1	3	B	None
R-35	Residential / B	Metro Lane	56	58	58	2	0	2	B	None
R-36	Residential / B	B Street	52	53	54	1	1	2	B	None
R-37	Residential / B	B Street	53	54	55	1	1	2	B	None

Receiver I.D.	Land Use / Activity Category	Location	Existing Noise Level L_{eq}(h), dBA	Future Worst Hour Noise Levels (Traffic Noise Only) - L_{eq}(h), dBA						
				Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)
R-38	Residential / B	B Street	47	49	49	2	0	2	B	None
R-39	Residential / B	B Street	59	61	61	2	0	2	B	None
R-40	Residential / B	B Street	59	61	61	2	0	2	B	None
R-41	Residential / B	B Street	59	60	61	1	1	2	B	None
R-42	Residential / B	B Street	59	60	61	1	1	2	B	None
R-43	Residential / B	B Street	59	60	61	1	1	2	B	None
R-44	Undeveloped / G	4th Street	64	67	69	3	2	5	G	None
R-45	Undeveloped / G	3rd Street	65	68	69	3	1	4	G	None
R-46	Residential / B	4th Street	61	64	65	3	1	4	B	None
R-47	Residential / B	3rd Street	62	65	66	3	1	4	B	A/E
R-48	Residential / B	3rd Street	60	63	64	3	1	4	B	None
R-49	Residential / B	4th Street	57	60	60	3	0	3	B	None
R-50	Residential / B	3rd Street	65	68	69	3	1	4	B	A/E
R-51	Residential / B	3rd Street	62	65	66	3	1	4	B	A/E
R-52	Residential / B	3rd Street	58	61	60	3	-1	2	B	None
R-53	Residential / B	3rd Street	57	60	61	3	1	4	B	None
R-54	Residential / B	3rd Street	56	58	58	2	0	2	B	None
R-55	Residential / B	3rd Street	53	56	57	3	1	4	B	None
R-56	Residential / B	3rd Street	57	60	61	3	1	4	B	None
R-57	Residential / B	3rd Street	55	58	58	3	0	3	B	None
R-58	Residential / B	3rd Street	57	58	60	1	2	3	B	None
R-59	Residential / B	3rd Street	59	60	62	1	2	3	B	None
R-60	Residential / B	2nd Street	61	63	65	2	3	4	B	None
R-61	Residential / B	2nd Street	60	62	65	2	3	5	B	None
R-62	Residential / B	2nd Street	60	61	64	1	3	4	B	None
R-63	Residential / B	3rd Street	60	61	62	1	1	2	B	None
R-64	Residential / B	3rd Street	59	60	62	1	2	3	B	None
R-65	Residential / B	3rd Street	58	59	61	1	2	3	B	None
R-66	Residential / B	2nd Street	59	61	63	2	2	4	B	None
R-67	Residential / B	2nd Street	58	59	61	1	2	3	B	None
R-68	Undeveloped / G	2nd Street	62	64	69	2	5	7	G	None
R-69	Undeveloped / G	2nd Street	56	57	66	1	9	10	G	None
R-70	Undeveloped / G	2nd Street	55	57	62	2	5	7	G	None
R-71	Undeveloped / G	2nd Street	55	57	60	2	3	5	G	None
R-72	Undeveloped / G	2nd Street	66	67	68	1	1	2	G	None
R-73	Undeveloped / G	2nd Street	65	66	67	1	1	2	G	None
R-74	Commerical / F	C Street	66	69	70	3	1	4	F	None
R-75	Undeveloped / G	Jiboom Street	71	73	73	2	0	2	G	None

Receiver I.D.	Land Use / Activity Category	Location	Existing Noise Level $L_{eq}(h)$, dBA	Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA						
				Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)
R-76	Park / C	Matsui Waterfront Park	71	73	73	2	0	2	C	None
ST-1	Undeveloped / G	4th Street	69	70	74	1	4	5	G	None
ST-2	Residential / B	4th Street	69	70	73	1	3	4	B	A/E
ST-3	Undeveloped / G	C Street	63	64	70	1	6	7	G	None
ST-4	Residential / B	2nd Street	63	64	69	1	5	6	B	A/E
ST-5	Residential / B	B Street	60	61	68	1	7	8	B	A/E

Notes:
A/E= Future noise conditions approach or exceed the Noise Abatement Criteria.

Table B-3. Impact Assessment and Predicted Noise Levels, 2nd Street ALT 2 and I Street Roundabout

Receiver I.D.	Land Use / Activity Category	Location	Existing Noise Level $L_{eq}(h)$, dBA	Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA						
				Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)
R-01	Residential / B	California Street	64	67	68	3	1	4	B	A/E
R-02	Residential / B	6th Street	62	65	67	3	2	5	B	A/E
R-03	Residential / B	6th Street	61	64	65	3	1	4	B	None
R-04	Residential / B	California Street	56	59	60	3	1	4	B	None
R-05	Residential / B	California Street	52	55	56	3	1	4	B	None
R-06	Residential / B	6th Street	60	63	64	3	1	4	B	None
R-07	Residential / B	6th Street	60	63	65	3	2	5	B	None
R-08	Residential / B	5th Street	62	66	67	4	1	5	B	A/E
R-09	Residential / B	6th Street	56	59	60	3	1	4	B	None
R-10	Residential / B	5th Street	60	64	65	4	1	5	B	None
R-11	Residential / B	5th Street	60	64	64	4	0	4	B	None
R-12	Undeveloped / G	5th Street	60	64	64	4	0	4	G	None
R-13	Residential / B	6th Street	66	69	71	3	2	5	B	A/E
R-14	Residential / B	C Street	67	70	72	3	2	5	B	A/E
R-15	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-16	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-17	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-18	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-19	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-20	Commerical / F	5th Street	65	68	69	3	1	4	F	None
R-21	Commerical / F	C Street	64	67	68	3	1	4	F	None
R-22	Residential / B	5th Street	58	62	63	4	1	5	B	None
R-23	Residential / B	5th Street	58	62	62	4	0	4	B	None
R-24	Residential / B	5th Street	55	57	58	2	1	3	B	None
R-25	Undeveloped / G	5th Street	64	67	69	3	2	5	G	None
R-26	Residential / B	5th Street	61	64	65	3	1	4	B	None
R-27	Residential / B	4th Street	66	69	71	3	2	5	B	A/E
R-28	Residential / B	4th Street	62	65	67	3	2	5	B	A/E
R-29	Residential / B	4th Street	59	62	63	3	1	4	B	None
R-30	Residential / B	C Street	66	70	70	4	0	4	B	A/E
R-31	Residential / B	C Street	66	69	70	3	1	4	B	A/E
R-32	Residential / B	4th Street	56	59	59	3	0	3	B	None
R-33	Residential / B	4th Street	55	58	59	3	1	4	B	None
R-34	Residential / B	Metro Lane	54	56	57	2	1	3	B	None
R-35	Residential / B	Metro Lane	56	58	57	2	-1	1	B	None
R-36	Residential / B	B Street	52	53	54	1	1	2	B	None
R-37	Residential / B	B Street	53	54	55	1	1	2	B	None

Receiver I.D.	Land Use / Activity Category	Location	Existing Noise Level $L_{eq}(h)$, dBA	Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA						
				Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)
R-38	Residential / B	B Street	47	49	49	2	0	2	B	None
R-39	Residential / B	B Street	59	61	61	2	0	2	B	None
R-40	Residential / B	B Street	59	61	61	2	0	2	B	None
R-41	Residential / B	B Street	59	60	61	1	1	2	B	None
R-42	Residential / B	B Street	59	60	61	1	1	2	B	None
R-43	Residential / B	B Street	59	60	61	1	1	2	B	None
R-44	Undeveloped / G	4th Street	64	67	69	3	2	5	G	None
R-45	Undeveloped / G	3rd Street	65	68	69	3	1	4	G	None
R-46	Residential / B	4th Street	61	64	65	3	1	4	B	None
R-47	Residential / B	3rd Street	62	65	66	3	1	4	B	A/E
R-48	Residential / B	3rd Street	60	63	64	3	1	4	B	None
R-49	Residential / B	4th Street	57	60	60	3	0	3	B	None
R-50	Residential / B	3rd Street	65	68	69	3	1	4	B	A/E
R-51	Residential / B	3rd Street	62	65	66	3	1	4	B	A/E
R-52	Residential / B	3rd Street	58	61	60	3	-1	2	B	None
R-53	Residential / B	3rd Street	57	60	61	3	1	4	B	None
R-54	Residential / B	3rd Street	56	58	58	2	0	2	B	None
R-55	Residential / B	3rd Street	53	56	57	3	1	4	B	None
R-56	Residential / B	3rd Street	57	60	61	3	1	4	B	None
R-57	Residential / B	3rd Street	55	58	58	3	0	3	B	None
R-58	Residential / B	3rd Street	57	58	59	1	1	2	B	None
R-59	Residential / B	3rd Street	59	60	62	1	2	3	B	None
R-60	Residential / B	2nd Street	61	63	65	2	3	4	B	None
R-61	Residential / B	2nd Street	60	62	65	2	3	5	B	None
R-62	Residential / B	2nd Street	60	61	64	1	3	4	B	None
R-63	Residential / B	3rd Street	60	61	63	1	2	3	B	None
R-64	Residential / B	3rd Street	59	60	61	1	1	2	B	None
R-65	Residential / B	3rd Street	58	59	61	1	2	3	B	None
R-66	Residential / B	2nd Street	59	61	63	2	2	4	B	None
R-67	Residential / B	2nd Street	58	59	61	1	2	3	B	None
R-68	Undeveloped / G	2nd Street	62	64	69	2	5	7	G	None
R-69	Undeveloped / G	2nd Street	56	57	66	1	9	10	G	None
R-70	Undeveloped / G	2nd Street	55	57	62	2	5	7	G	None
R-71	Undeveloped / G	2nd Street	55	57	60	2	3	5	G	None
R-72	Undeveloped / G	2nd Street	66	67	68	1	1	2	G	None
R-73	Undeveloped / G	2nd Street	65	66	67	1	1	2	G	None
R-74	Commerical / F	C Street	66	69	70	3	1	4	F	None
R-75	Undeveloped / G	Jiboom Street	71	73	73	2	0	2	G	None

Receiver I.D.	Land Use / Activity Category	Location	Existing Noise Level $L_{eq}(h)$, dBA	Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA						
				Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)
R-76	Park / C	Matsui Waterfront Park	71	73	73	2	0	2	C	None
ST-1	Undeveloped / G	4th Street	69	70	74	1	4	5	G	None
ST-2	Residential / B	4th Street	69	70	73	1	3	4	B	A/E
ST-3	Undeveloped / G	C Street	63	64	70	1	6	7	G	None
ST-4	Residential / B	2nd Street	63	64	69	1	5	6	B	A/E
ST-5	Residential / B	B Street	60	61	68	1	7	8	B	A/E

Notes:
A/E= Future noise conditions approach or exceed the Noise Abatement Criteria.

Table B-4. Impact Assessment and Predicted Noise Levels, 2nd Street ALT 2 and I Street Signalized Intersection

Receiver I.D.	Land Use / Activity Category	Location	Existing Noise Level $L_{eq}(h)$, dBA	Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA						
				Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)
R-01	Residential / B	California Street	64	67	68	3	1	4	B	A/E
R-02	Residential / B	6th Street	62	65	67	3	2	5	B	A/E
R-03	Residential / B	6th Street	61	64	65	3	1	4	B	None
R-04	Residential / B	California Street	56	59	60	3	1	4	B	None
R-05	Residential / B	California Street	52	55	56	3	1	4	B	None
R-06	Residential / B	6th Street	60	63	64	3	1	4	B	None
R-07	Residential / B	6th Street	60	63	65	3	2	5	B	None
R-08	Residential / B	5th Street	62	66	67	4	1	5	B	A/E
R-09	Residential / B	6th Street	56	59	60	3	1	4	B	None
R-10	Residential / B	5th Street	60	64	65	4	1	5	B	None
R-11	Residential / B	5th Street	60	64	64	4	0	4	B	None
R-12	Undeveloped / G	5th Street	60	64	64	4	0	4	G	None
R-13	Residential / B	6th Street	66	69	71	3	2	5	B	A/E
R-14	Residential / B	C Street	67	70	72	3	2	5	B	A/E
R-15	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-16	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-17	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-18	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-19	Residential / B	C Street	67	70	71	3	1	4	B	A/E
R-20	Commerical / F	5th Street	65	68	69	3	1	4	F	None
R-21	Commerical / F	C Street	64	67	68	3	1	4	F	None
R-22	Residential / B	5th Street	58	62	63	4	1	5	B	None
R-23	Residential / B	5th Street	58	62	62	4	0	4	B	None
R-24	Residential / B	5th Street	55	57	58	2	1	3	B	None
R-25	Undeveloped / G	5th Street	64	67	69	3	2	5	G	None
R-26	Residential / B	5th Street	61	64	65	3	1	4	B	None
R-27	Residential / B	4th Street	66	69	71	3	2	5	B	A/E
R-28	Residential / B	4th Street	62	65	67	3	2	5	B	A/E
R-29	Residential / B	4th Street	59	62	63	3	1	4	B	None
R-30	Residential / B	C Street	66	70	70	4	0	4	B	A/E
R-31	Residential / B	C Street	66	69	70	3	1	4	B	A/E
R-32	Residential / B	4th Street	56	59	59	3	0	3	B	None
R-33	Residential / B	4th Street	55	58	59	3	1	4	B	None
R-34	Residential / B	Metro Lane	54	56	57	2	1	3	B	None
R-35	Residential / B	Metro Lane	56	58	57	2	-1	1	B	None
R-36	Residential / B	B Street	52	53	54	1	1	2	B	None
R-37	Residential / B	B Street	53	54	55	1	1	2	B	None

Receiver I.D.	Land Use / Activity Category	Location	Existing Noise Level L_{eq}(h), dBA	Future Worst Hour Noise Levels (Traffic Noise Only) - L_{eq}(h), dBA						
				Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)
R-38	Residential / B	B Street	47	49	49	2	0	2	B	None
R-39	Residential / B	B Street	59	61	61	2	0	2	B	None
R-40	Residential / B	B Street	59	61	61	2	0	2	B	None
R-41	Residential / B	B Street	59	60	61	1	1	2	B	None
R-42	Residential / B	B Street	59	60	61	1	1	2	B	None
R-43	Residential / B	B Street	59	60	61	1	1	2	B	None
R-44	Undeveloped / G	4th Street	64	67	69	3	2	5	G	None
R-45	Undeveloped / G	3rd Street	65	68	69	3	1	4	G	None
R-46	Residential / B	4th Street	61	64	65	3	1	4	B	None
R-47	Residential / B	3rd Street	62	65	66	3	1	4	B	A/E
R-48	Residential / B	3rd Street	60	63	64	3	1	4	B	None
R-49	Residential / B	4th Street	57	60	60	3	0	3	B	None
R-50	Residential / B	3rd Street	65	68	69	3	1	4	B	A/E
R-51	Residential / B	3rd Street	62	65	66	3	1	4	B	A/E
R-52	Residential / B	3rd Street	58	61	60	3	-1	2	B	None
R-53	Residential / B	3rd Street	57	60	61	3	1	4	B	None
R-54	Residential / B	3rd Street	56	58	58	2	0	2	B	None
R-55	Residential / B	3rd Street	53	56	57	3	1	4	B	None
R-56	Residential / B	3rd Street	57	60	61	3	1	4	B	None
R-57	Residential / B	3rd Street	55	58	58	3	0	3	B	None
R-58	Residential / B	3rd Street	57	58	60	1	2	3	B	None
R-59	Residential / B	3rd Street	59	60	62	1	2	3	B	None
R-60	Residential / B	2nd Street	61	63	65	2	3	4	B	None
R-61	Residential / B	2nd Street	60	62	65	2	3	5	B	None
R-62	Residential / B	2nd Street	60	61	64	1	3	4	B	None
R-63	Residential / B	3rd Street	60	61	63	1	2	3	B	None
R-64	Residential / B	3rd Street	59	60	61	1	1	2	B	None
R-65	Residential / B	3rd Street	58	59	61	1	2	3	B	None
R-66	Residential / B	2nd Street	59	61	63	2	2	4	B	None
R-67	Residential / B	2nd Street	58	59	61	1	2	3	B	None
R-68	Undeveloped / G	2nd Street	62	64	69	2	5	7	G	None
R-69	Undeveloped / G	2nd Street	56	57	66	1	9	10	G	None
R-70	Undeveloped / G	2nd Street	55	57	62	2	5	7	G	None
R-71	Undeveloped / G	2nd Street	55	57	60	2	3	5	G	None
R-72	Undeveloped / G	2nd Street	66	67	68	1	1	2	G	None
R-73	Undeveloped / G	2nd Street	65	66	67	1	1	2	G	None
R-74	Commerical / F	C Street	66	69	70	3	1	4	F	None
R-75	Undeveloped / G	Jiboom Street	71	73	73	2	0	2	G	None

Receiver I.D.	Land Use / Activity Category	Location	Existing Noise Level $L_{eq}(h)$, dBA	Future Worst Hour Noise Levels (Traffic Noise Only) - $L_{eq}(h)$, dBA						
				Design Year Noise Level without Project, Leq(h), dBA	Design Year Noise Level with Project, Leq(h), dBA	Design Year Noise Level without Project minus Existing Conditions Leq(h), dBA	Design Year Noise Level with Project minus No Project Conditions Leq(h), dBA	Design Year Noise Level with Project minus Existing Conditions Leq(h), dBA	Activity Category (NAC)	Impact Type (None, or A/E)
R-76	Park / C	Matsui Waterfront Park	71	73	73	2	0	2	C	None
ST-1	Undeveloped / G	4th Street	69	70	74	1	4	5	G	None
ST-2	Residential / B	4th Street	69	70	73	1	3	4	B	A/E
ST-3	Undeveloped / G	C Street	63	64	70	1	6	7	G	None
ST-4	Residential / B	2nd Street	63	64	69	1	5	6	B	A/E
ST-5	Residential / B	B Street	60	61	68	1	7	8	B	A/E

Notes:
A/E= Future noise conditions approach or exceed the Noise Abatement Criteria.

Appendix C Supplemental Data

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: I Street Bridge
PROJECT #: 0263.14
SITE NUMBER: ST-1
DATE/TIME: 09/15/15
LOCATION/ADDRESS: 4th & C Street field
ENGINEERS: D Traeger & C Matsui

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1	[redacted] 1:44	77.8					
2	1:45	60.1					
3	1:46	60.5					car ↘
4	1:47	55.2					
5	1:48	54.5					
6	1:49	54.0					
7	1:50	53.0					
8	1:51	53.8					
9	1:52	54.6					train ↘
10	1:53	61.7					
11	1:54	56.5					car ↑
12	1:55	55.9					
13	1:56	55.3					
14	1:57	56.8					
15	1:58	52.9					
16							
17							
18							
19							
20							

Leq	57.5
Lmax	81.1
Lmin	44.0
L10	59.4
L33	56.0
L50	54.2
L90	47.4

Overall Leq (Include "O" minutes, Exclude "X" minutes) = _____ dBA

Subset Leq (Exclude "O" and "X" minutes) = _____ dBA

"O" = other characteristic sources that contributed to the Leq

"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: ~~3~~ I Street Bridge

PROJECT #: 0203.14

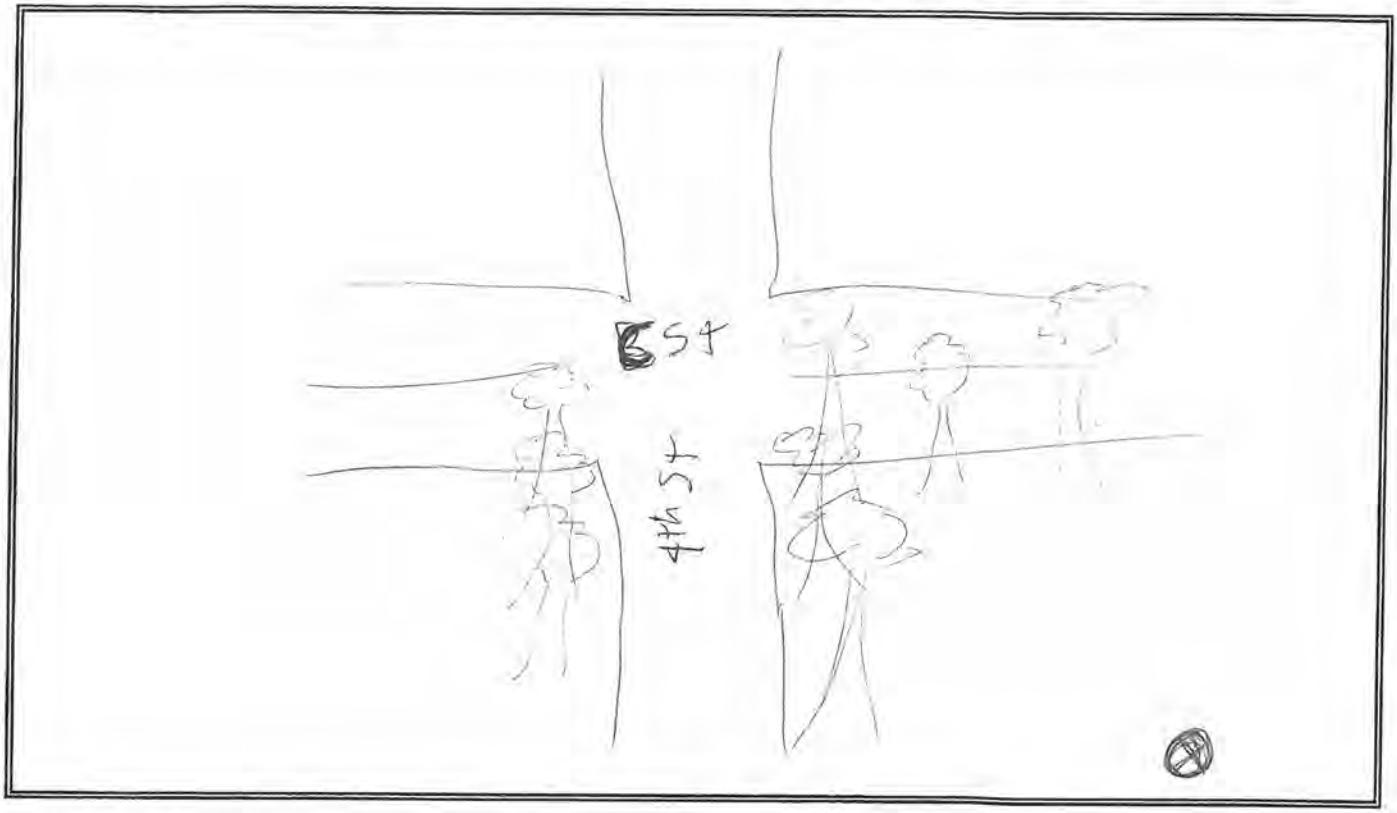
SITE NUMBER: ST - 1

DATE/TIME: 04/16/15

LOCATION/ADDRESS: 4th & ~~6~~ - field -

ENGINEERS: D. Traeger & C Matsui

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

28.5°C, 1.2 mph, Sunny

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

0507 114.0

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction)

POSTED SPEED: 30 - 35 COMMENTS:

TRAFFIC COUNTS:

Roadway/Direction	Autos	Medium	Heavy	Speed	Start Time	Duration
C Street	171	0	0			

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: I Street Bridge
PROJECT #: 00203.14
SITE NUMBER: ST-2
DATE/TIME: 9/16/15
LOCATION/ADDRESS: 281 4th Street
ENGINEERS: C. Matsui

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1	11:25	67.5					
2	11:26	58.7					car on 4th St
3	11:27	59.7					
4	11:28	55.4					
5	11:29	59.9					
6	11:30	62.2					siren
7	11:31	61.4					car & garage " "
8	11:32	57.8					car, car, car " "
9	11:33	62.6					~~car, car~~ car " "
10	11:34	66.5					car, car " "
11	11:35	57.6					
12	11:36	52.8					
13	11:37	56.9					
14	11:38	57.0					
15	11:39	56.2					car
16							
17							
18							
19							
20							

Leq	61.4
Lmax	86.6
Lmin	45.3
L10	62.2
L33	58.4
L50	55.4
L90	48.0

Overall Leq (Include "O" minutes, Exclude "X" minutes) = _____ dBA

Subset Leq (Exclude "O" and "X" minutes) = _____ dBA

"O" = other characteristic sources that contributed to the Leq

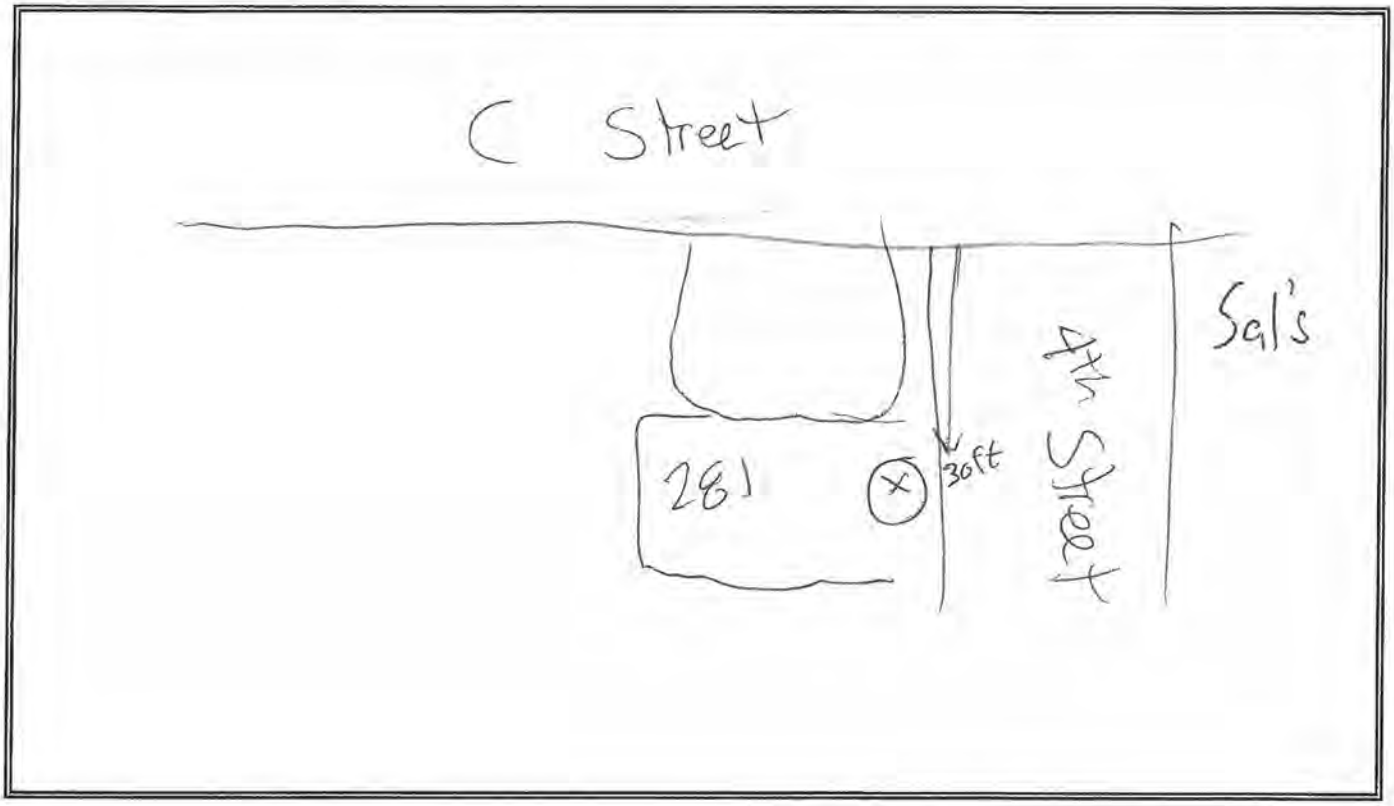
"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: I Street Bridge
PROJECT #: 00203.14
SITE NUMBER: ST-2
DATE/TIME: 9/16/15
LOCATION/ADDRESS: 281 4th street
ENGINEERS: C Matsui

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

27°C, 0.7mph, clear/sunny,

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

0507 114.0

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction)

POSTED SPEED: 30 COMMENTS: Moto-1

TRAFFIC COUNTS:

Roadway/Direction	Autos	Medium	Heavy	Speed	Start Time	Duration
C street	149	2	1	30-35	11:25	15 mins

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: I Street Bridge
PROJECT #: 00203,14
SITE NUMBER: ST-3 next to apts & billboard
DATE/TIME: 4/16 11:50
LOCATION/ADDRESS: field ~~[illegible]~~
ENGINEERS: C Matsui

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1	1150	69.4					car
2	1151	66.8					
3	1152	59.1					
4	1153	58.9					
5	1154	59.2					
6	1155	57.4					
7	1156	60.6					
8	1157	59.5					
9	1158	72.2					
10	1159	59.8					car
11	1200	58.6					
12	1201	61.0					
13	1202	59.[illegible]					
14	1203	72.1					train & plane
15	1204	63.9					
16							
17							
18							
19							
20							

Leq	69.2
Lmax	89.8
Lmin	51.6
L10	64.7
L33	59.4
L50	57.7
L90	54.5

Overall Leq (Include "O" minutes, Exclude "X" minutes) = _____ dBA

Subset Leq (Exclude "O" and "X" minutes) = _____ dBA

"O" = other characteristic sources that contributed to the Leq

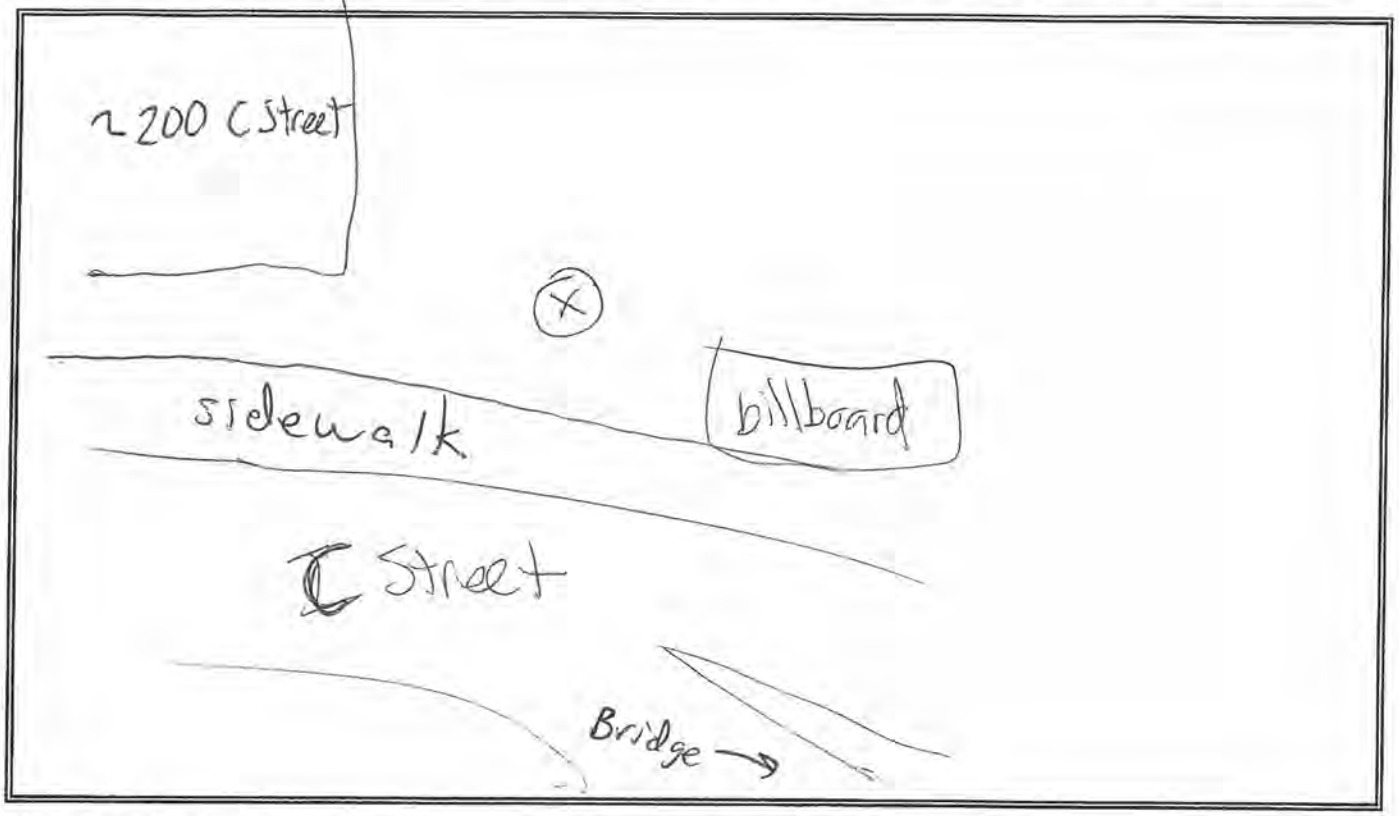
"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: I Street Bridge
PROJECT #: 00203.14
SITE NUMBER: ST 3
DATE/TIME: 4/16/15
LOCATION/ADDRESS: Field next to apts & billboard
ENGINEERS: C Matsui

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

26°C 0.9 mph, Sunny

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

0507 1/4,0

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction)

POSTED SPEED: 30-35 COMMENTS:

TRAFFIC COUNTS: moto 3

Roadway/Direction	Autos	Medium	Heavy	Speed	Start Time	Duration
C Street	166	0	1	30-35	11:50	15 min
3rd St	23	2	0	25	"	"

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: I Street Bridge
PROJECT #: 0203.14
SITE NUMBER: ST-4
DATE/TIME: 04/16/15
LOCATION/ADDRESS: 212 2nd Street driveway
ENGINEERS: C. Matsui

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1	1438	53.9					
2	1439	48.4					
3	1440	54.2					
4	1441	48.0					
5	1442	49.1					car starting
6	1443	48.7					
7	1444	52.7					
8	1445	48.3					
9	1446	46.8					
10	1447	49.9					Car
11	1448	46.9					
12	1449	46.5					
13	1450	52.0					
14	1451	47.2					
15	1452	47.8					voices
16							
17							
18							
19							
20							

Leq	50.3
Lmax	67.9
Lmin	44.5
L10	51.9
L33	48.3
L50	47.5
L90	45.8

Overall Leq (Include "O" minutes, Exclude "X" minutes) = _____ dBA

Subset Leq (Exclude "O" and "X" minutes) = _____ dBA

"O" = other characteristic sources that contributed to the Leq

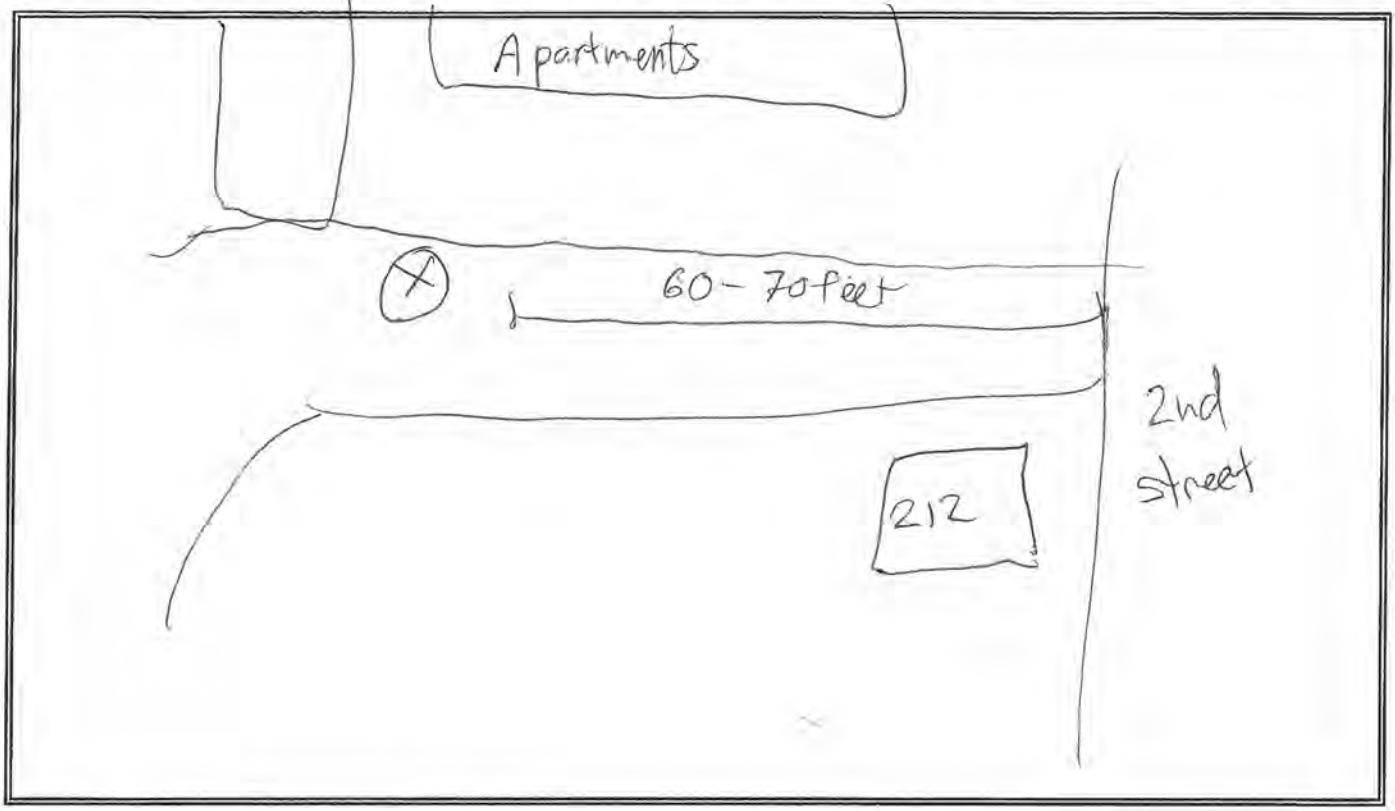
"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: I Street Bridge
PROJECT #: 0203.14
SITE NUMBER: ST-4
DATE/TIME: 04/16/15
LOCATION/ADDRESS: 212 2nd Street
ENGINEERS: C Matsui

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

29°C 1.1 knots Sunny/clear

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

0507 113.9

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction)

POSTED SPEED: N/A COMMENTS:

TRAFFIC COUNTS:

Roadway/Direction	Autos	Medium	Heavy	Speed	Start Time	Duration
No visible roadways w/ substantial traffic						

NOISE MEASUREMENT LOG SHEET (20)

Jones & Stokes

PROJECT NAME: I Street Bridge
PROJECT #: 00203.14
SITE NUMBER: ST-5
DATE/TIME: 04/16/15
LOCATION/ADDRESS: B Street, before dead end
ENGINEERS: C Matsui

#	Minute Starting	Measured Leq (dBA)	O or X	Autos	Medium Trucks	Heavy Trucks	Other Noise Sources/Comments (include SLM equipment, Calibration Data)
1	1411	54.4					train, car
2	1412	52.9					train
3	1413	50.1					train
4	1414	49.3					train, voices
5	1415	48.2					
6	1416	55.1					
7	1417	55.3					
8	1418	48.7					
9	1419	45.8					car
10	1420	49.4					
11	1421	46.5					
12	1422	45.3					
13	1423	45.8					
14	1424	45.8					
15	1425	50.2					
16							
17							
18							
19							
20							

Leq	51.1
Lmax	70.1
Lmin	43.6
L10	52.0
L33	48.0
L50	46.8
L90	45.0

Overall Leq (Include "O" minutes, Exclude "X" minutes) = _____ dBA

Subset Leq (Exclude "O" and "X" minutes) = _____ dBA

"O" = other characteristic sources that contributed to the Leq

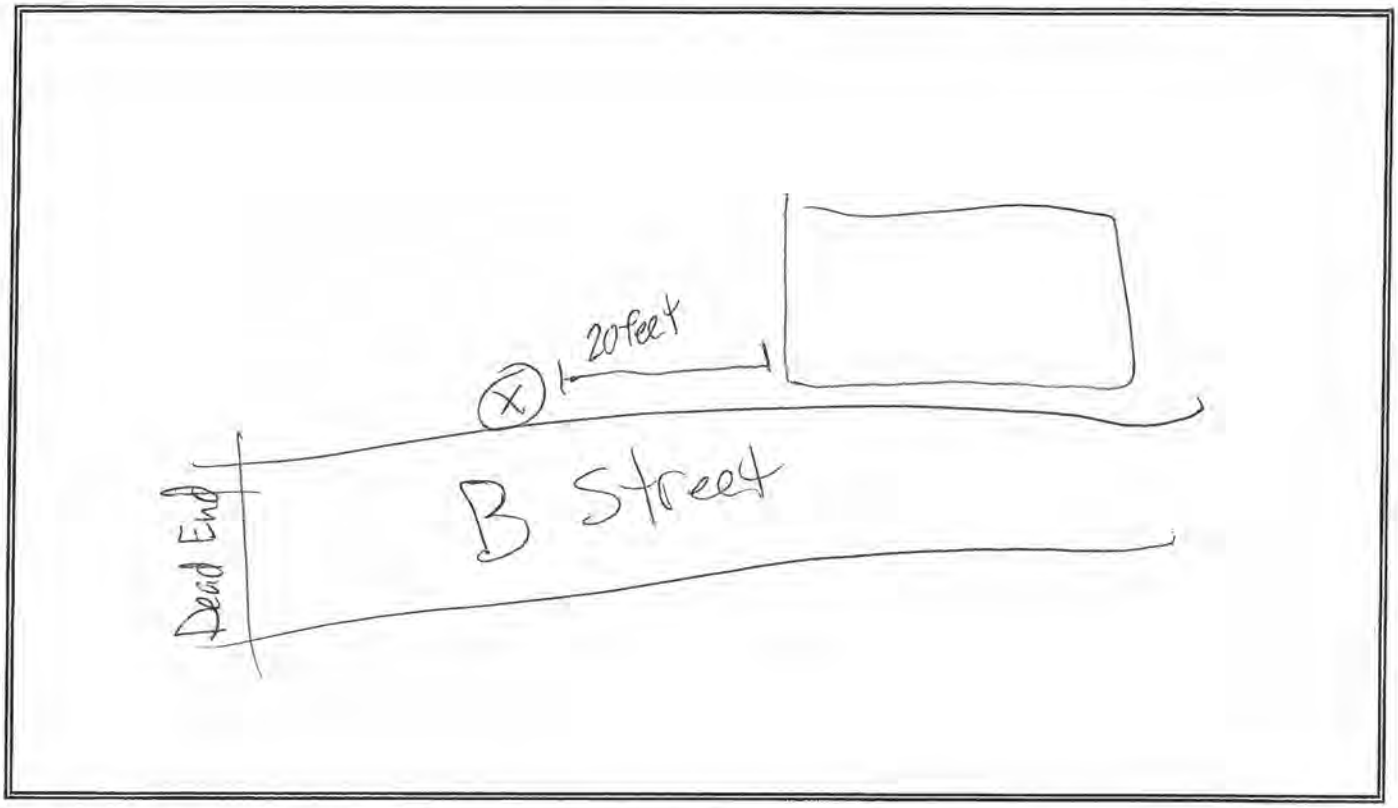
"X" = exclude from Leq calculation; a non-typical source contaminated the measurement

NOISE MEASUREMENT SITE INFORMATION SHEET

Jones & Stokes

PROJECT NAME: I Street Bridge
PROJECT #: 0203, 14
SITE NUMBER: ST-5
DATE/TIME: 04/16/15
LOCATION/ADDRESS: B Street, before dead end
ENGINEERS: C Matsui

SITE SKETCH: Show microphone location, nearby residences/buildings, potential reflective surfaces, project roadways, local roadways, driveways, ground type, trees. Indicate reference distances between objects, arrows showing wind direction, North, and camera locations/directions. Describe the line-of-sight and topography/elevation changes relative to noise sources.



WEATHER DATA: (temperature, wind speed/direction, sky conditions, relative humidity)

30° C, 2.1 mph, sunny

EQUIPMENT DATA: (sound level meter, microphone, preamp, calibrator, factory cal. date)

0507 114.0

ESTIMATED CONSTRUCTION DATE OF RESIDENCES: (Pre-1978, or new construction)

POSTED SPEED: N/A COMMENTS:

TRAFFIC COUNTS:

Roadway/Direction	Autos	Medium	Heavy	Speed	Start Time	Duration
No visible roadways with substantial traffic						

TETRA TECH

MEMORANDUM

TO:	Don Trieu, PE (MBK Engineers)
FROM:	Dragi Stefanovic, PhD, PE; Ira Artz, PE (Tetra Tech)
JOB TITLE:	I-Street Bridge Replacement
SUBJECT:	Scour Analysis
DATE:	May 2, 2016

This technical memorandum describes the scour analysis for the I-Street crossing over the Sacramento River, California that was conducted by Tetra Tech to support the MBK bridge replacement design (Figure 1). The analysis described here pertains to with-project (proposed) conditions, assuming that the existing I-Street Bridge remains in place, about 1,100 feet downstream of the proposed bridge location. Descriptions of the assumptions, inputs, methodologies, and results of this analysis are provided below.

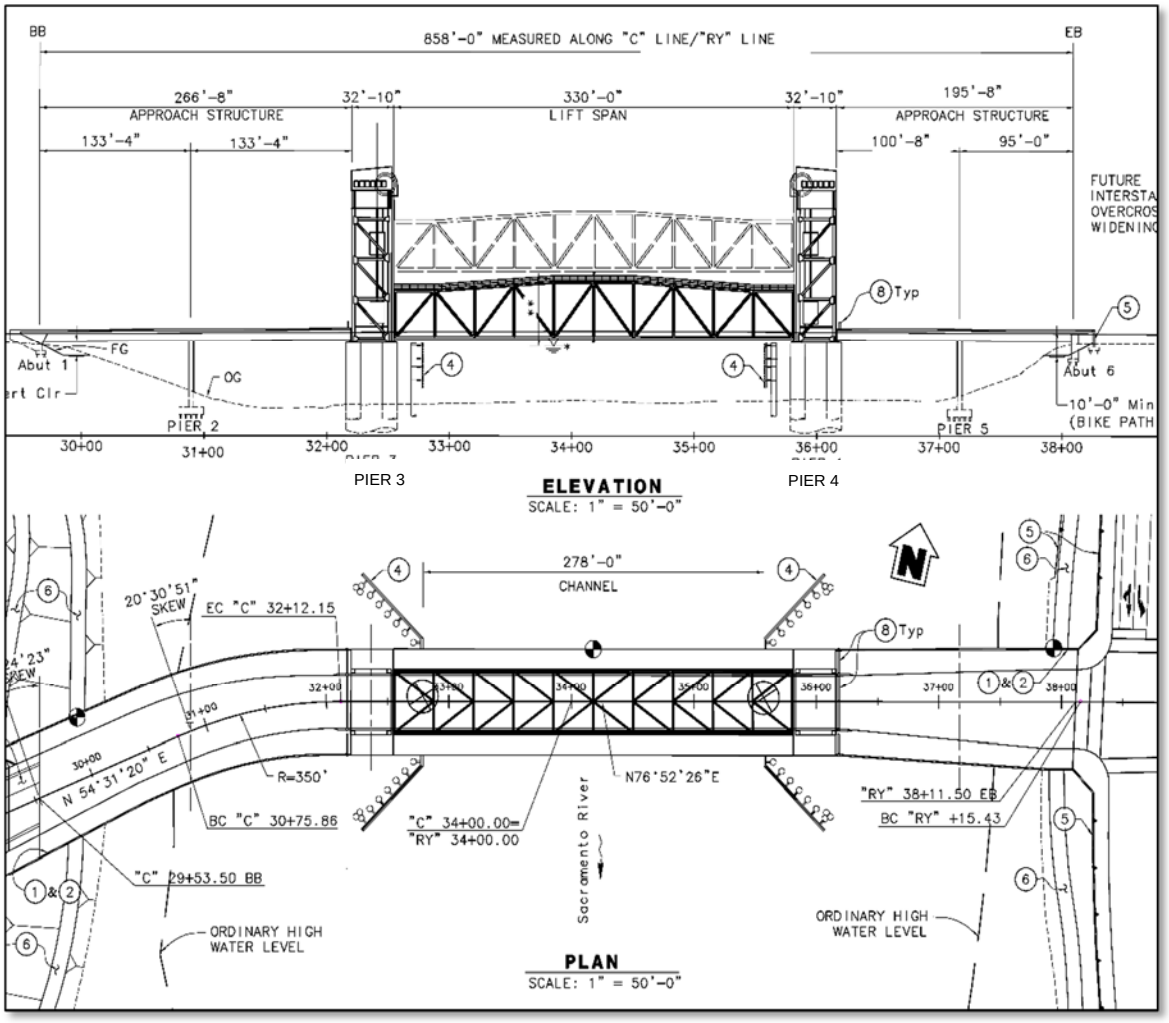


Figure 1. I-Street Bridge Proposed Design

Hydraulic Analysis

A hydraulic analysis was carried out in the vicinity of the bridge crossing using a hydraulic (HEC-RAS) model of the Sacramento River study reach downstream of the confluence with the American River. The study reach was extracted from an unsteady hydraulic model of the Sacramento River Basin (developed by USACE Sacramento District) and was ported into latest HEC-RAS 5.0. The 26-mile modeling reach extended from the confluence with the American River on the upstream side (River Station RS 60.3928) to the confluence with Sutter Slough on the downstream side (RS 34.3042). The maximum design discharges for a range of return frequencies were extracted from the USACE model at RS 60.3928 at the maximum water surface elevation (see Table 1). The downstream boundary condition at RS 34.3042 was set to normal depth with an average energy slope of 0.000115 (this slope is fairly uniform within the analyzed range of discharges and was extracted from the unsteady hydraulic model for the maximum water surface profile).

Table 1. Sacramento River Maximum Design Discharges

Frequency	50-year	100-year	200-year
Discharge (cfs)	113,796	117,655	130,674

There are 8 bridge piers considered in this scour analysis as shown in

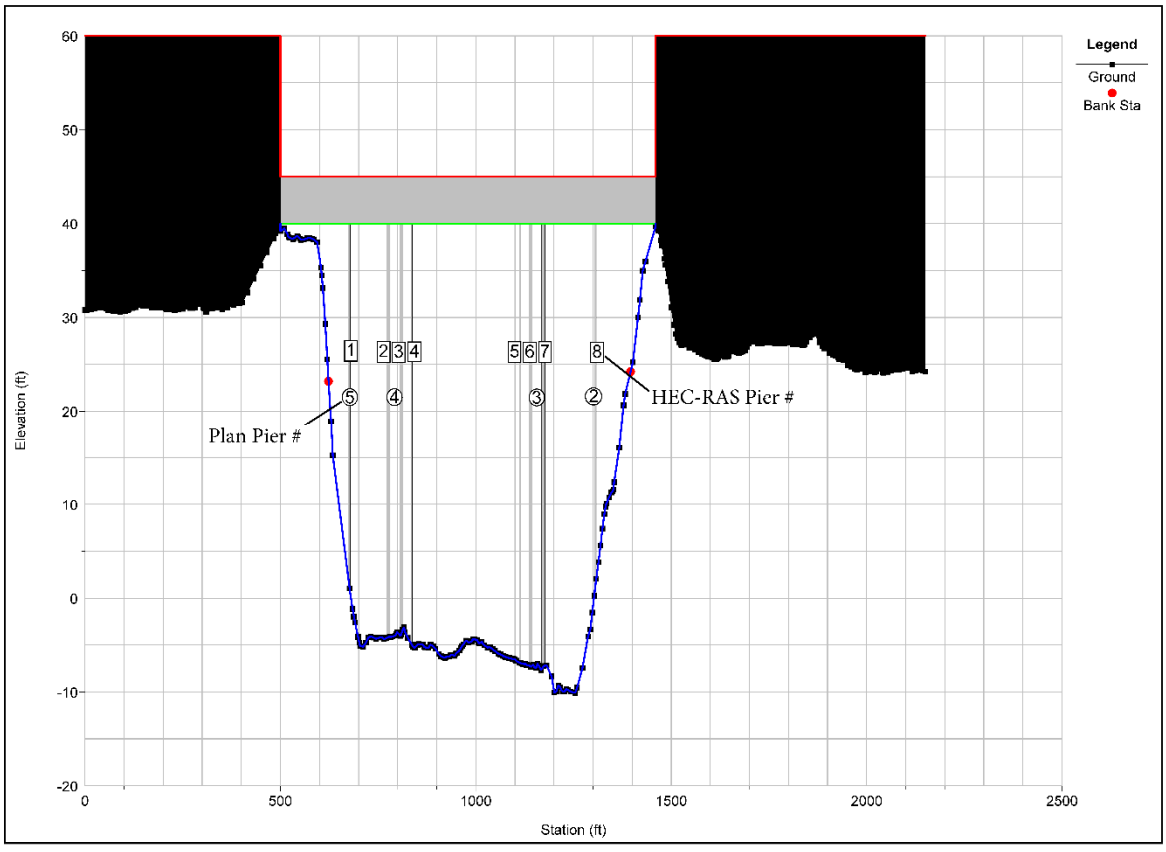


Figure 2.

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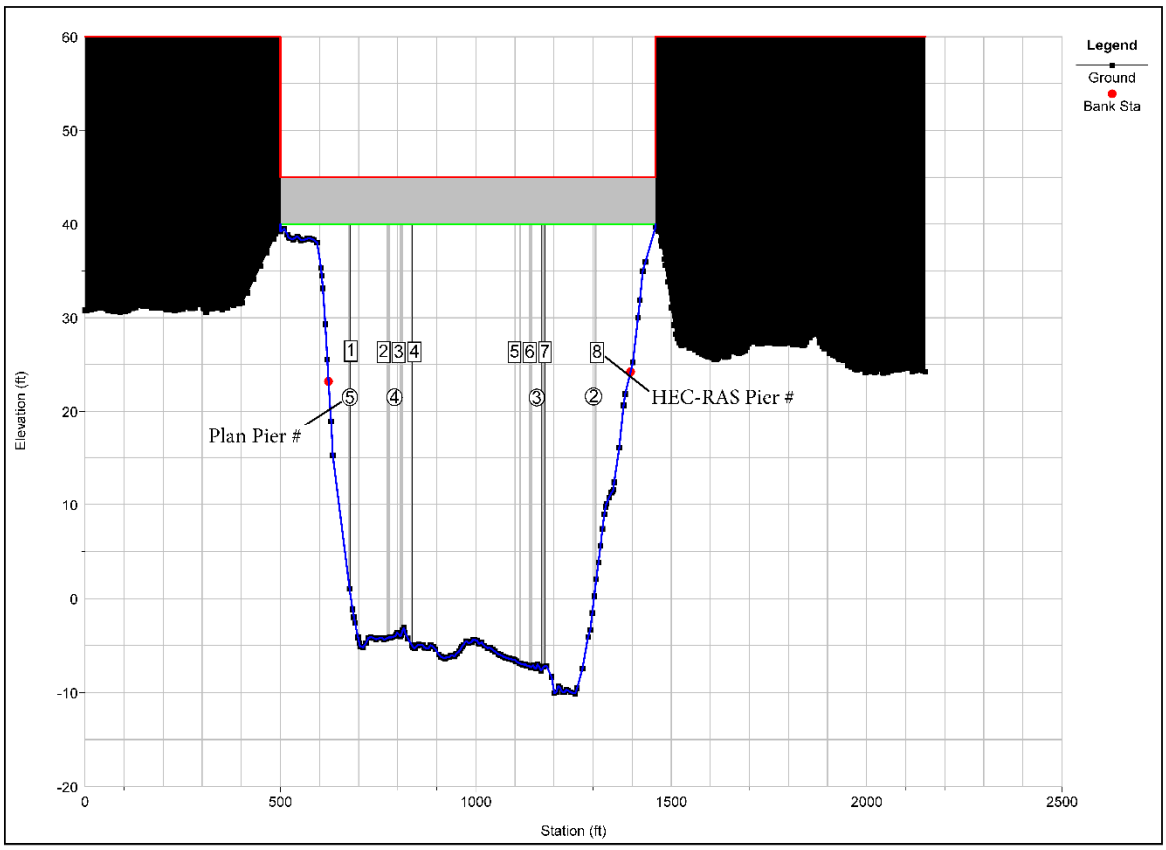

Figure 2. I-Street Bridge HEC-RAS Profile at RS 59.904

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It should be noted that the cross-section pier stationing in

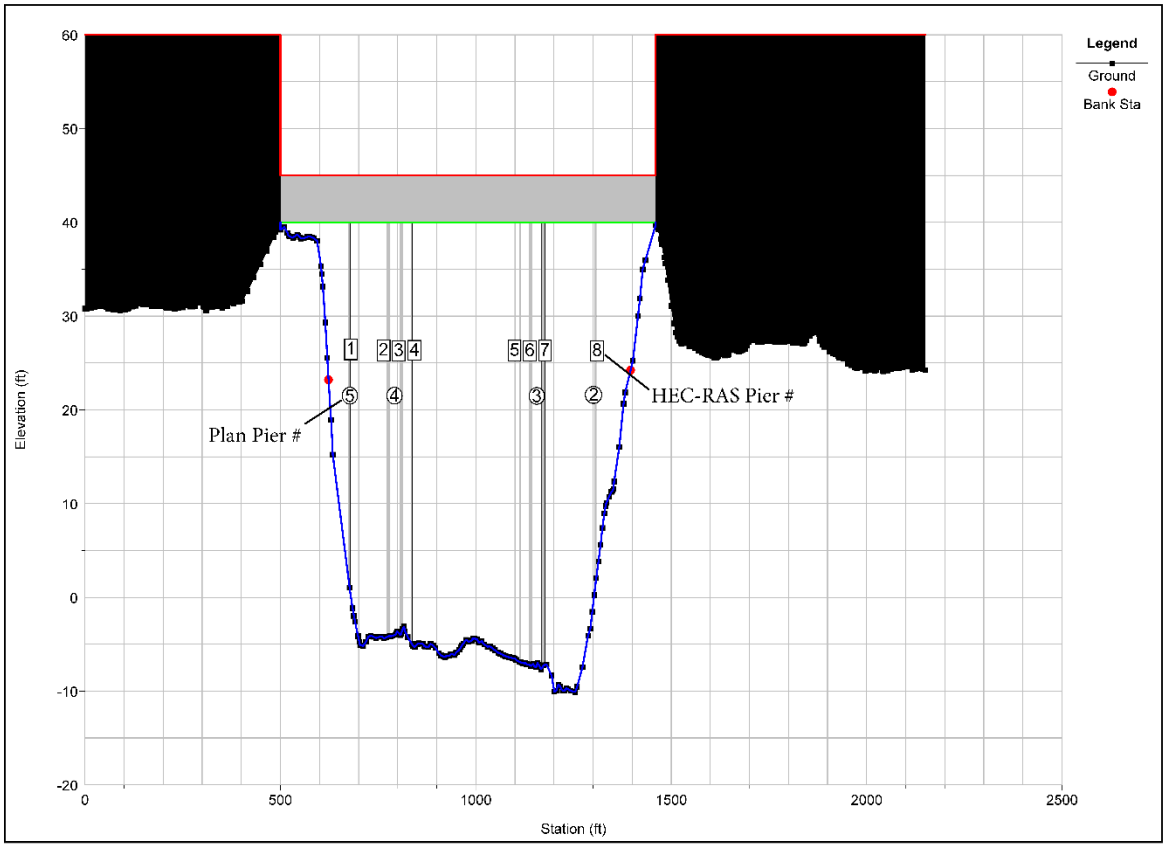

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Figure 2 is oriented from left to right, looking downstream, while the pier stationing on the bridge plans (Figure 1) is oriented from left to right, looking upstream. For reference

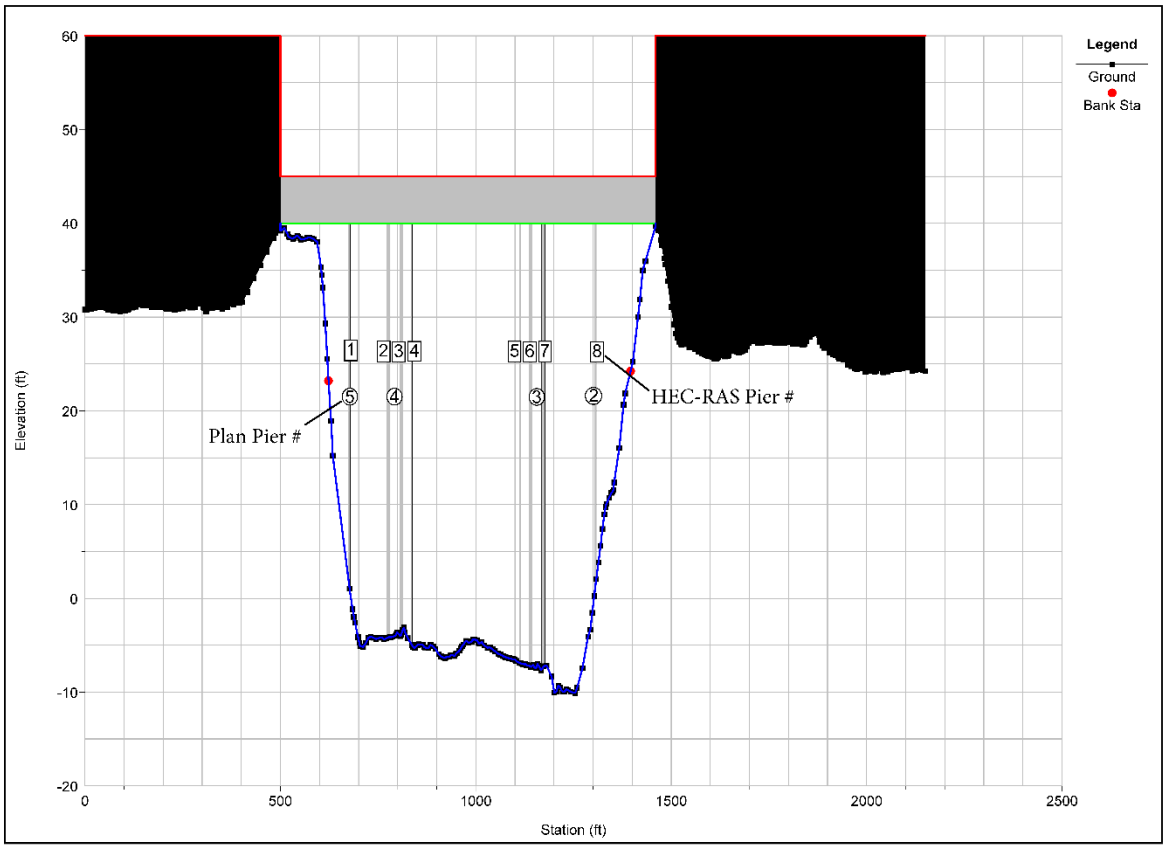

Figure 2 shows the HEC-RAS pier numbers in square boxes and the corresponding design plan pier numbers in circles. The lift tower piers, labeled 3 & 4 on the plans (Figure 1), have two 9-ft diameter piers on each side (labeled 2 & 3 and 6 & 7 in Figure 2). Exterior piers, labeled 2 & 5 on the plans, have a diameter of 5.5 feet. The bridge fender system (inside the lift span; see Figure 1) is carried by two most interior 4-ft diameter piers (labeled 4 and 5 in Figure 2).

Potential debris loading in the form of floatable trash was considered for each pier in the HEC-RAS model according to the USACE *Memorandum on Debris Loading on Bridges and Culverts* (2004). Two feet of debris on each side of each pier was assumed for the full depth of flow at piers without sloping pier extensions. According to the *Memorandum*, no debris loading was assumed for piers with widths greater than six feet.

The effect of debris loading on pier scour was accounted for using the concept of *effective pier width*, which has been widely accepted as a way to quantitatively assess the extent to which debris affects scour at piers (NCHRP, 2010). Based on the laboratory scour data, the recommended design equation for estimating an equivalent pier width b_e for use with the CSU pier scour equation is:

$$b_e = \frac{K_1(TW) + (y - K_1 T)a}{y} \quad (1)$$

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where:
b_e = effective width of the pier
K_1 = 0.79 for rectangular debris loading
T = thickness of debris (assumed equal to flow depth)
W = width of debris normal to flow
a = pier width (without debris) normal to flow
y = depth of approach flow

A summary of pier parameters is given in Table 2. The approach flow depth *y* and velocity *V* were calculated using the simplified (1-D) Flow Distribution option in HEC-RAS.

Table 2. I-Street Bridge Pier Characteristics

HEC-RAS Pier #	Design Plan Pier #	HEC-RAS Station	*a* (ft)	*W* (ft)	b_e (ft)	*y* (ft)	*V* (ft/s)
1	5	676.0	5.5	9.5	8.7	33.4	3.2
2	4	776.7	9.0	9.0	9.0	38.9	4.2
3	4	809.5	9.0	9.0	9.0	38.6	4.2
4	/	835.5	4.0	8.0	7.2	39.6	4.2
5	/	1113.5	4.0	8.0	7.2	41.6	4.3
6	3	1139.5	9.0	9.0	9.0	42.0	4.3
7	3	1172.3	9.0	9.0	9.0	42.1	4.5
8	2	1305.7	5.5	9.5	8.7	33.5	4.1

a = pier width; *W* = debris width; b_e = effective pier width; *y* = 100-year approach flow depth; *V* = 100-year approach flow velocity;

Scour Analysis

A scour analysis was carried out at the proposed I-Street Bridge crossing (RS 59.904) using the results of the steady HEC-RAS model described above. The hydraulic analysis was performed assuming that the existing bridge remains at RS 59.687, about 1,100 feet downstream of the proposed bridge. The results of the scour analysis are intended to assist in developing recommendations for pier foundation burial depths at the proposed river crossing.

Scour Analysis Procedure

The total scour that is expected to occur at a particular river location typically consists of five primary components:

1. Long-term degradation
2. Bend scour
3. Contraction scour
4. Bedform scour
5. Local scour (pier scour, impinging scour)

Long-term aggradation and degradation represent bed elevation changes that result from an imbalance in the sediment supplied to a reach of the river and the capacity of the reach to transport the sediment. Aggradation (deposition of sediment on the channel bed) occurs when the upstream sediment supply is greater than the transport capacity, and degradation (erosion of the streambed) occurs when the transport capacity is greater than the supply.

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Historical evidence and sediment transport simulations indicate that the Sacramento River in the vicinity of the proposed I-Street crossing (RS 59.904) is vertically stable (NHC, 2012). The summary results of simulated long-term bed aggradation/degradation in the Sacramento River are shown in Table 3.

Table 3. Simulated Long-Term Bed Aggradation/Degradation (NHC, 2012)

*Positive = aggradation, negative = degradation

As shown in Table 3, the sub-reach River Mile (RM=RS) 60-50 experiences a slight aggradation trend on the order of 1 foot. For the purposes of this scour analysis, it was, therefore, assumed that long-term aggradation and degradation are not likely to affect the I-Street Bridge crossing.

Bend scour occurs on the outside of a bend due to the increased flow velocity and shear stress that results from the acceleration of flow around the bend. Because of the proposed bridge location in a bend (with a radius of 6,475 feet), the pier foundations could potentially be affected by bend scour. Several different methods have been proposed in literature for computing bend scour that are based on empirical and semiempirical relationships. Based on a comparison of conditions in the Sacramento River with the conditions for which it was developed (i.e. increased toe scour of armored bank revetment), the following relationship by Maynord (1996) was adopted for this study:

$$\frac{y_{bs}}{y} = 1.8 - 0.051\frac{r_c}{B} + 0.0084\frac{B}{y} \quad (2)$$

where:
y_{bs}= ultimate flow depth in scoured section
y = hydraulic depth in the approach bend section
B = flow top width
r_c = centerline radius of bend curvature

Bend scour is then equal to the predicted ultimate flow depth (y_{bs}) in the scoured section minus the initial flow depth.

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Contraction scour represents general erosion of the channel bed that results from a contraction in the flow area or a local increase in the unit discharge due to overbank flows being forced into the main channel. Two types of contraction scour can occur, depending upon the ability of the upstream channel to transport sediment into the contracted section: live-bed contraction scour occurs when bed material is transported into the contracted section, and clear-water contraction scour occurs when there is negligible transport of bed material into the contracted section or the material from upstream is transported through the contracted section at less than the capacity of the flow. Contraction scour was considered at the bridge site due to constriction from piers. The scour was computed using the following relation from the Federal Highway Administration (FHWA) Hydraulic Circular No. 18, Evaluation of Scour at Bridges (2001), which is based on live-bed conditions:

$$\frac{y_2}{y_1} = \left(\frac{Q_2}{Q_1}\right)^{6/7} \left(\frac{W_1}{W_2}\right)^{k_1} \quad , \quad y_s = y_2 - y_0 \tag{3}$$

where:
y_s = average scour depth
y_2 = average depth in the contracted section
y_1 = average depth in the upstream main channel
y_0 = existing depth in the contracted section before scour
Q_1 = flow in the upstream channel transporting sediment
Q_2 = flow in the contracted channel transporting sediment
W_1 = bottom width of the upstream main channel
W_2 = bottom width of the main channel in the contracted section
k_1 = 0.64 assuming that some of the bed material would be carried in suspension

Bedform scour is the increase in scour depth that can occur as bedforms pass through the site during high flows. Because the Sacramento River has a sand bed within the study area, antidune scour was considered at the crossing site (median grain size D_{50} ~ 0.5 mm; upper regime bedforms, such as antidunes, are possible based on the grain Froude number evaluation). The antidune height was computed using the following relation from Kennedy (1963):

$$h_a = 0.14 \frac{2\pi V^2}{g} \tag{4}$$

where:
h_a= antidune height
V = flow velocity
g = acceleration due to gravity

Scour associated with antidunes is one-half the antidune height predicted by Equation 4.

Local scour results from the removal of material around obstructions to the flow such as bridge piers, abutments, spurs and embankments due to acceleration of the flow and the resulting turbulent vortices induced by the obstructions. The potential pier scour depth was computed using the CSU relation from HEC-18 (FHWA, 2001):

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$$y_s = 2K_1K_2K_3K_4\left(\frac{a}{y_1}\right)^{0.65} F_r^{0.43} \quad (5)$$

where:
y_s = pier scour depth
y_1 = flow depth directly upstream of pier
K_1 = correction factor for pier nose shape = 1.1 for square nose (with debris loading)
K_2 = correction factor for angle of attack of flow = 1.0 for flow aligned with the pier
K_3 = correction factor for bed condition = 1.0 (bedform scour calculated separately)
K_4 = correction factor for armoring by bed material = 1.0 for no armoring potential
a = pier width
F_r = Froude number directly upstream of pier

Because the proposed I-Street Bridge location is relatively close to the Sacramento River and American River confluence (approximately 2,300 feet downstream of the confluence), an additional local scour component can result from the American River flow impinging on the right (west) bank of the Sacramento River. The evidence of this scour can be observed in the bridge cross section (see Figure 2) where the right bank toe is currently about 6 feet lower than the corresponding left (east) side. An approximation of the potential scour depth at the Sacramento River right bank toe is based on the following formulation for impinging scour along a floodwall (Mussetter et al., 1994):

$$\frac{Y_S}{Y_1} = (0.73 + 0.14\pi F_r^2)cos\theta \quad (6)$$

where:
Y_S = equilibrium depth of scour (measured from the mean bed level to the bottom of the scour hole)
Y_1 = average upstream flow depth in the main channel
F_r = upstream Froude number
θ = deflection angle between flow direction and floodwall

The above input parameters were based on the American River hydraulics (from the USACE HEC-RAS model) immediately upstream of the confluence with the Sacramento River, assuming a 30-degree deflection angle θ.

Scour Analysis Results

The scour analysis results for the 50-year, 100-year, and 200-year flow events are summarized in Table 4. The most significant component of the calculated scour is the Sacramento River outside bend scour, which accounts for about 60 percent of the total scour at the site. It should be noted that this bend scour was added only to the western piers 1-4 (which are closer to the outside bank), while the eastern piers 5-8 were assumed to be impacted by the impinging flow from the American River. The total scour varies 2-4 feet between the analyzed flow events, being the largest for the 100-year and 200-year frequencies. The potential scour holes are shown in Figure 3 (this is a HEC-RAS plot of combined pier and contraction scour). The scour hole width on each side of the pier is

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calculated as 2 times the depth of local scour y_s from Equation 5 (per FHWA, 2001). As shown in Figure 3, piers 2-4 and piers 5-7 have overlapping scour holes, combining into a single scour hole with the lowest bottom elevation.

Table 4. Computed Scour Depths for Proposed I-Street Bridge at RS 59.904

HEC-RAS	50-Year Scour (ft)					100-Year Scour (ft)					200-Year Scour (ft)					Max
Pier No.	Bend*	Antidune	Pier	Contr	Total	Bend*	Antidune	Pier	Contr	Total	Bend*	Antidune	Pier	Contr	Total	Total
1	21.6	0.2	8.3	2.5	32.5	21.9	0.2	11.2	2.5	35.9	23.1	0.2	8.6	2.7	34.6	35.9
2	21.6	0.2	13.1	2.5	37.4	21.9	0.2	13.2	2.5	37.9	23.1	0.2	13.5	2.7	39.5	39.5
3	21.6	0.2	13.0	2.5	37.3	21.9	0.2	13.1	2.5	37.8	23.1	0.2	13.5	2.7	39.5	39.5
4	21.6	0.2	7.7	2.5	32.0	21.9	0.2	11.4	2.5	36.1	23.1	0.2	8.0	2.7	34.0	36.1
5	11.7	0.2	7.9	2.5	22.4	12.1	0.2	11.7	2.5	26.6	13.5	0.2	8.2	2.7	24.6	26.6
6	11.7	0.2	13.5	2.5	27.9	12.1	0.2	13.6	2.5	28.4	13.5	0.2	13.9	2.7	30.3	30.3
7	11.7	0.2	13.6	2.5	28.0	12.1	0.2	13.7	2.5	28.6	13.5	0.2	14.0	2.7	30.4	30.4
8	11.7	0.2	9.3	2.5	23.7	12.1	0.2	12.6	2.5	27.5	13.5	0.2	9.6	2.7	26.0	27.5

*Sacramento River bend scour for outside piers 1-4; American River confluence scour for inside piers 5-8

As seen in Table 4, the maximum predicted scour is on the order of 40 feet (piers 2 & 3). This estimate includes conservative assumptions on pier shape, debris width, riverbed conditions, and no armoring potential by coarser bed material. In addition, bend scour was conservatively evaluated using the Maynord (1996) formulation for increased toe scour of armored bank revetments. Therefore, no additional safety factor was applied when determining the maximum total scour. For comparison, a previous (two-dimensional) pipeline scour study on the Sacramento River by Mussetter Engineers (2002) predicted the maximum 200-year bed scour at RS 62 on the order of 39 feet (predominantly bend scour without bridge piers) and 51 feet (for alternate pipeline alignment with additional pier scour).

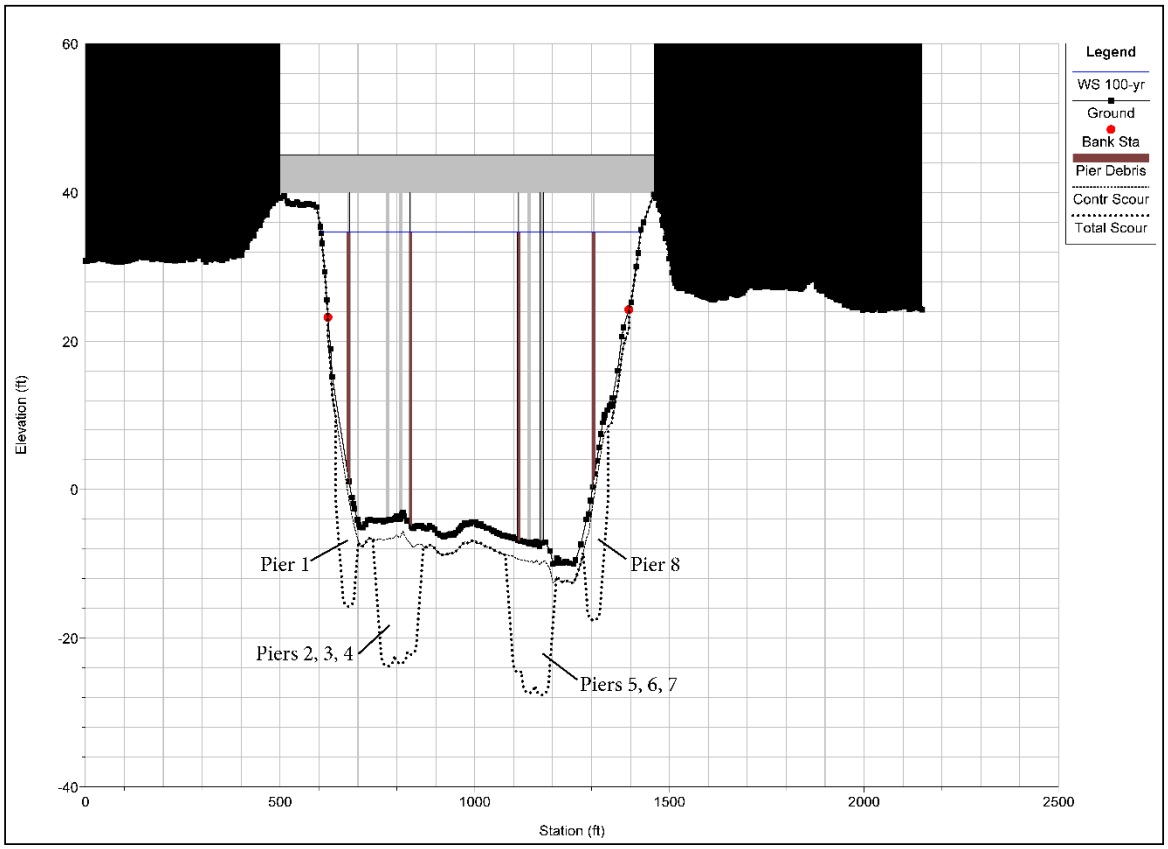

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Figure 3. Pier and Contraction Scour Extents at Proposed I-Street Bridge

Scour Elevations

In the design of bridge pier foundations, the scour elevations should be at or below the total depth of scour. Based on Table 4, the minimum recommended scour elevations for the bridge pier foundations are listed in Table 5 below. A detailed structural/geotechnical analysis needs to be performed do determine actual foundation depths, accounting for the given minimum scour elevations.

Table 5. Minimum Recommended Scour Elevations

HEC-RAS Pier #	Design Plan Pier #	Minimum Ground Elevation* (ft)	Total Scour (ft)	Scour Elevation (ft)
1	5	0.6	35.9	-35.3
2, 3, 4	4	-5.2	39.5	-44.7
5, 6, 7	3	-7.6	30.4	-38.0
8	2	0.2	27.5	-27.3

*based on HEC-RAS ground points at pier location in cross section 59.912; these elevations should be verified against design plans

In the next design phase, a two-dimensional (2-D) hydrodynamic modeling, that provides more accurate prediction of the flow pattern at the proposed I-Street Bridge crossing (particularly because the bridge is located in the impinging scour impact zone of the American River confluence), would be necessary for a refined scour analysis.

Abutment Protection

According to HEC-23 (FHWA, 2009), the bridge abutments should be protected from local scour using rock riprap or guide banks. The toe or apron of the riprap serves as the base for the slope protection and must be carefully designed to resist scour while maintaining the support for the slope protection. A typical cross section for abutment riprap is shown in Figure 4.

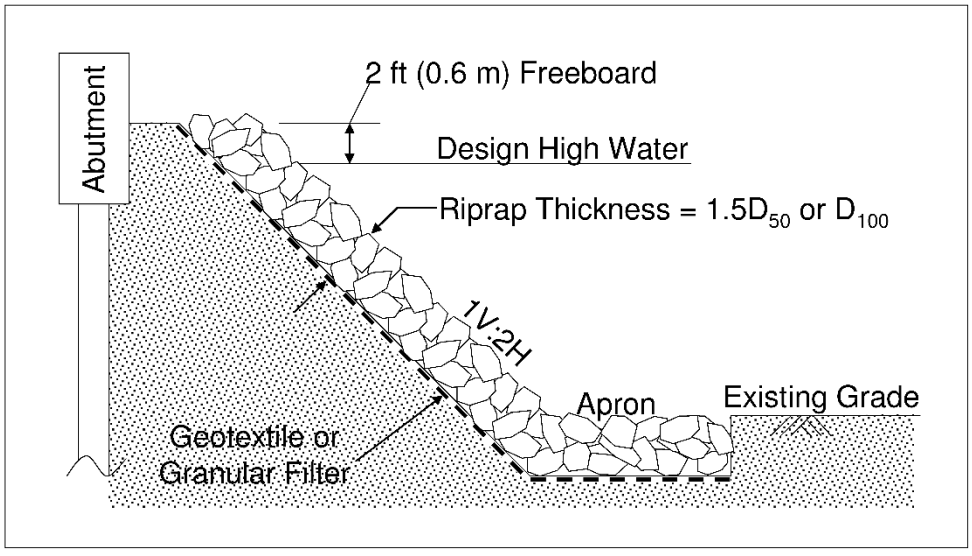

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Figure 4. Typical cross section for abutment riprap (Lagasse et al. 2006)

For Froude numbers less than 0.8, the recommended design equation for sizing rock riprap for spill-through and vertical wall abutments is in the form of the Isbash relationship:

$$\frac{D_{50}}{y} = \frac{K}{(S_s - 1)}\left[\frac{V^2}{gy}\right] \quad (7)$$

where:
D_{50} = median stone diameter
V = characteristic average velocity in the contracted section
S_s = specific gravity of rock riprap
g = gravitational acceleration
y = depth of flow in the contracted bridge opening
K = 0.89 for a spill-through abutment; 1.02 for a vertical wall abutment

The characteristic average velocity in the I-Street Bridge contracted section is V= 4.7 ft/s for the 200-year flood event. This results in a minimum recommended median stone diameter D_{50}= 5 in. The layer thickness should not be less than 1 foot for practical placement. Table 6 provides recommended gradations for ten standard classes of riprap (FHWA, 2009) based on the median particle diameter D_{50} as determined by the dimension of the intermediate ("B") axis. According to Table 6, Class I riprap should be selected. Geotextile filters or granular filters should also be used in conjunction with riprap bank protection.

Table 6. Minimum and Maximum Allowable Riprap Size in Inches (FHWA, 2009)

References

Federal Highway Administration (FHWA) (2001). Evaluating Scour at Bridges, Hydraulic Engineering Circular No. 18. U.S. Department of Transportation, Federal Highway Administration, Office of Technology Applications, HTA-22, Washington, D.C.

FHWA (2009). Bridge Scour and Stream Instability Countermeasures: Experience, Selection, and Design Guidance-Third Edition, Hydraulic Engineering Circular No. 23. U.S.

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Department of Transportation, Federal Highway Administration, Office of Bridge Technology, Washington, D.C.

Kennedy, J.F. (1963). Mechanics of Dunes and Antidunes in Erodible-Bed Channels. Journal of Fluid Mechanics, v. 16, pt. 4, pp 521-544.

Lagasse, P.F., Clopper, P.E., Zevenbergen, L.W., and Ruff, J.F. (2006). Riprap Design Criteria, Recommended Specifications, and Quality Control. NCHRP Report 568, Transportation Research Board, National Academies of Science, Washington, D.C.

Maynord, S.T. (1996). Toe-Scour Estimation in Stabilized Bendways. Journal of Hydraulic Engineering, ASCE, Vol. 122, No. 8.

Mussetter Engineering, Inc. (2002). Scour Analysis for the Lower Northwest Interceptor Pipeline Crossings at RM 62 and RM 47, Sacramento River, California, October 2002.

Mussetter, R.A., Lagasse, P.F., and Harvey, M.D. (1994). Erosion and Sediment Design Guide, prepared for Albuquerque Metropolitan Arroyo and Flood Control Authority.

National Cooperative Highway Research Program (NCHRP) (2010). Effects of Debris on Bridge Pier Scour, Report 653, Washington, D.C.

Northwest Hydraulic Consultants (2012). Sacramento River Sediment Study – Phase II Sediment Transport Modeling and Channel Shift Analysis, prepared for U.S. Army Corps of Engineers, Sacramento District, December 2012.

U.S. Army Corps of Engineers (2004). Hydrology and Hydraulics Policy Memorandum No. 4, Debris Loading on Bridges and Culverts, August 2004.

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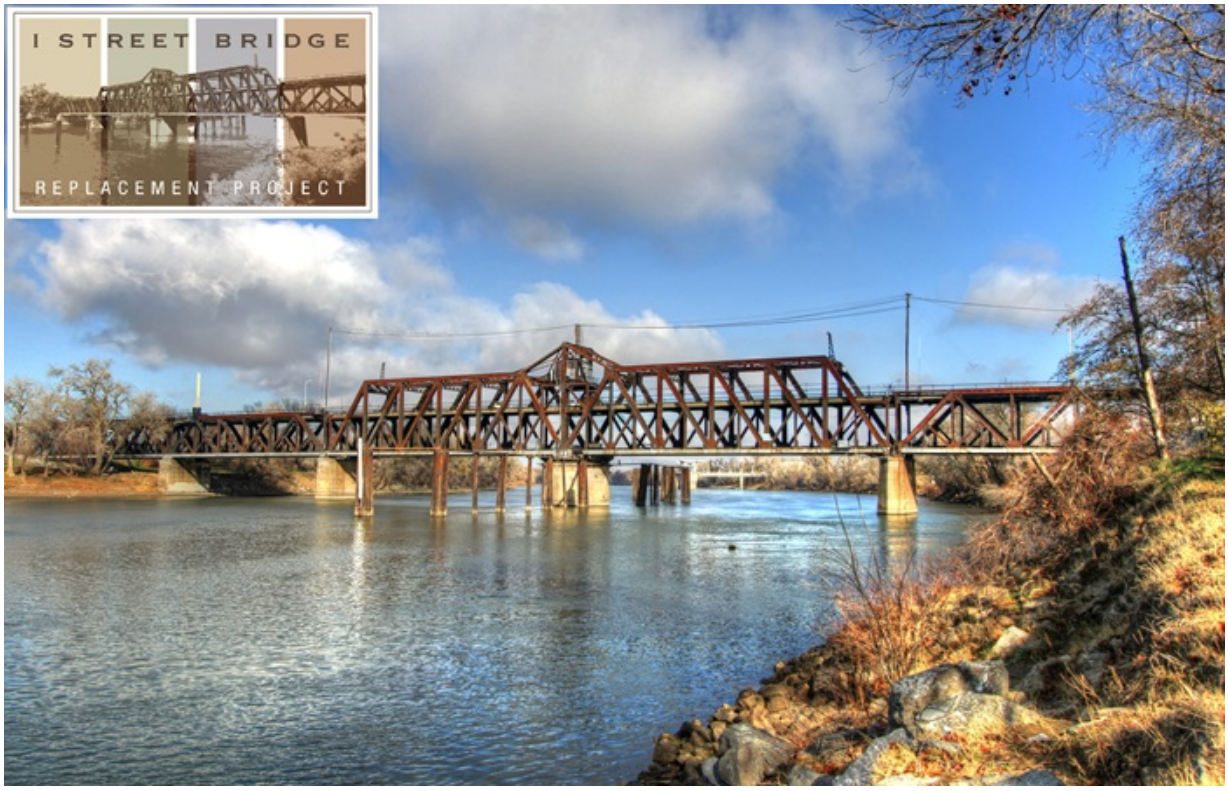

Biological Assessment

I Street Bridge Replacement Project

Sacramento and Yolo Counties

Federal Project No.: BRLS 5002(164)

June 2016

Caltrans
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Biological Assessment

I Street Bridge Replacement Project
Sacramento and Yolo Counties
Federal Project No.: BRLS 5002(164)

June 2016

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Summary of Findings, Conclusions and Determinations

The City of Sacramento, in cooperation with the City of West Sacramento and the California Department of Transportation (Caltrans), proposes to construct a new bridge over the Sacramento River to replace the vehicle crossing that is currently accommodated by the existing I Street Bridge in order to remove a series of functionally obsolete or structurally deficient bridges (i.e., approach structures). The new connection also would reduce future traffic congestion, improve operations and safety, serve multiple modes of transportation, and comply with current American Association of State Highway and Transportation Officials, Caltrans, and local agency design standards. The new approximately 860-foot-long bridge, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides, would be located north of the existing I Street Bridge. The proposed bridge would be a five-span bridge, with an approximately 330-foot-long movable center span to meet U.S. Coast Guard (USCG) requirements. Both in-water and out-of-water construction activities would be required.

The purpose of this biological assessment (BA) is to provide technical information and to review the proposed project in sufficient detail to determine to what extent the proposed project may affect species that are federally threatened, endangered, or proposed for threatened or endangered status. This BA was prepared in accordance with legal requirements found in Section 7(a)(2) of the Endangered Species Act (ESA) (16 U.S. C 1536[c]) and based on Federal Highway Administration (FHWA) and Caltrans regulation, policy and guidance.

S.1 Summary of Federally Listed Species Impacts

The biological study area (BSA) currently supports suitable habitat for two federally listed species, valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) and delta smelt (*Hypomesus transpacificus*) (both listed as threatened under the ESA), and is considered designated critical habitat for delta smelt.

S.1.1 Valley Elderberry Longhorn Beetle

The proposed project is *likely to adversely affect* valley elderberry longhorn beetle (VELB) through the destruction of suitable habitat for the species. Construction of the proposed project would result in the removal of five elderberry shrubs and indirect effects on two shrubs.

Implementation of avoidance and minimization measures prior to and during construction will minimize indirect effects on VELB. Permanent removal of five shrubs with 26 stems greater than 1 inch in diameter will be mitigated through the planting of 34 elderberry seedlings and 34 associated native plants at a U.S. Fish and Wildlife Service approved mitigation bank.

S.1.2 Delta Smelt

The project is *likely to adversely affect* delta smelt and designated critical habitat. The primary effect of the project would be the exposure of some fish to harmful noise levels during impact pile driving, potentially resulting in harassment, injury or death of individuals. The probability of injury or death is difficult to predict and would be based on the timing and frequency of pile driving; the extent that vibratory drivers and attenuation devices would minimize the duration and intensity of impact pile driving; and the numbers, size, and mobility of listed species that may occur in the vicinity of the construction area while impact pile driving is occurring. In addition, cofferdam construction and dewatering may cause delta smelt to be injured or killed if they become trapped in cofferdams as they are being installed. Even with implementation of the proposed avoidance and minimization measures, construction activities may cause fish to delay their migration or cease spawning in response to increased turbidity, suspended sediment, and underwater noise; however, any behavioral effects would be temporary and are not expected to measurably affect growth, survival, or reproductive success. The project may also result in indirect effects on delta smelt including the potential for increases in predation rates resulting from the added overwater structure (shade) and nighttime lighting of the bridge during and after construction, from the accidental introduction of invasive aquatic species, and from a reduction in water quality associated with added runoff from increased impervious surfaces.

The proposed project would also result in a permanent loss of 1.44 acres of cottonwood riparian forest habitat, supporting 0.44 acre and 890 linear feet of shaded riverine aquatic (SRA) cover habitat; aquatic habitat (substrate and water column) for delta smelt equal to the permanent loss of 10,449 square feet (0.24 acre) of substrate area; and a net permanent loss of 32,650 cubic feet of water column (aquatic) habitat from construction of the new in-water bridge piers and pilings for the new bridge fender system. In addition, construction of the new bridge would result in the creation of approximately 55,000 square feet (1.26 acres) of permanent over-water structure (shade) on the Sacramento River from the deck of the new bridge.

Project effects on critical habitat for delta smelt include temporary effects on water quality (underwater noise and increased turbidity and suspended sediment). No permanent effects on critical habitat for delta smelt would occur from construction of the new bridge because the footprint of the new bridge is not located within designated critical habitat for delta smelt. Because of the temporary nature of construction activities and the proposed compensation for permanent effects of the project on habitat structure and function, no long-term effects on the primary constituent elements (PCEs) or conservation value of critical habitat in the region would be expected.

S.2 Summary of Mitigation Agreements

The project proponents are proposing to implement the following measures to avoid and minimize project effects on federally listed species (these measures are discussed in more detail in Chapter 4).

- Measure 1: Install Orange Construction Fencing between the Construction Area and Adjacent Sensitive Biological Resources
- Measure 2: Conduct Environmental Awareness Training for Construction Employees
- Measure 3: Conduct Periodic Biological Monitoring
- Measure 4: Avoid and Minimize Impacts on Valley Elderberry Longhorn Beetle
- Measure 5: Transplant Elderberry Shrubs That Cannot Be Avoided
- Measure 6: Compensate for Impacts on Valley Elderberry Longhorn Beetle Habitat
- Measure 7: Conduct All In-Water Construction Activities between May 1 and November 30 and during Daylight Hours Only
- Measure 8: Implement Measures to Minimize Exceedance of Interim Threshold Sound Levels during Pile Driving
- Measure 9: Develop and Implement a Hydroacoustic Monitoring Plan
- Measure 10: Protect Water Quality and Prevent Erosion and Sedimentation in Drainages and Wetlands
- Measure 11: Monitor Turbidity in the Sacramento River
- Measure 12: Implement Cofferdam Restrictions
- Measure 13: Prepare and Implement a Fish Rescue and Relocation Plan
- Measure 14: Prevent the Spread or Introduction of Aquatic Invasive Species
- Measure 15: Minimize or Avoid Temporary Construction Lighting and Permanent Bridge Lighting from Directly Radiating on Water Surfaces of the Sacramento River
- Measure 16: Compensate for Loss of Perennial Stream
- Measure 17: Compensate for Temporary Effects to and Permanent Loss of Cottonwood Riparian Forest (including SRA Cover)

S.3 Summary of Determinations

S.3.1 Valley Elderberry Longhorn Beetle

The proposed project is *likely to adversely affect* VELB based on the "take" of VELB habitat during project construction. To minimize indirect effects, the project proponents will implement avoidance and minimization measures prior to and during construction and will compensate for effects on VELB habitat as described in Chapter 4.

S.3.2 Delta Smelt

The proposed project is *likely to adversely affect* delta smelt based on the potential for "take" of delta smelt during project construction. The greatest potential for take would occur during impact pile driving, which would generate underwater noise levels that are predicted to reach levels that can cause harassment, injury, and mortality of fish; and during the installation and dewatering of cofferdams, which could entrap individuals and result in mortality. In addition, temporary delays in movement or cessation of spawning activity may occur in response to increased turbidity, suspended sediment, or underwater noise. Any behavioral effects, however, would be temporary and are not expected to measurably affect growth, survival, or reproductive success. To minimize direct and indirect effects, the project proponent will implement avoidance and minimization measures prior to and during construction, and will compensate for temporary effects on, and loss of habitat for, delta smelt as described in Chapter 4. Therefore, the project is not expected to reduce appreciably the survival and recovery of delta smelt in the Sacramento River or region.

Project effects on critical habitat include temporary effects on water quality during construction from temporary increases in turbidity and suspended sediment. The project proponents will implement avoidance and minimization measures prior to and during construction to minimize and avoid temporary construction effects on water quality, as described in Chapter 4. In addition, the project proponents will compensate for effects on designated critical habitat for anadromous salmonids and green sturgeon as part of the consultation process with NMFS, and this compensation will also likely benefit delta smelt. No permanent effects on critical habitat would occur from construction of the new bridge. Therefore, no further compensation for designated critical habitat would be required.

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List of Abbreviated Terms

ADA	Americans with Disabilities Act
AIS	aquatic invasive species
BA	biological assessment
BMPs	best management practices
BSA	biological study area
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CDFA	California Department of Food and Agriculture
Central Valley Subprovince	Sacramento-San Joaquin Province
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CIDH	cast-in-drill-hole
CL	layer of clay
CNDDB	California Natural Diversity Database
CPT	cone penetration tests
CVFPB	Central Valley Flood Protection Board
dB	decibel
dB RMS	decibels root mean square
DJFMP	Delta Juvenile Fish Monitoring Program
DWSC	Deep Water Ship Channel
ESA	Endangered Species Act
FHWA	Federal Highway Administration
FHWG	Fisheries Hydroacoustic Working Group
GP	dense gravel
Guidelines	USFWS's 1999 Conservation Guidelines for the Valley Elderberry Longhorn Beetle

HBP	Highway Bridge Program
HUC	hydrologic unit code
I-5	Interstate 5
ICF	ICF International
LSAA	Lake or Streambed Alteration Agreement
ML	layer of sandy silt
mm	millimeters
MTP	Metropolitan Transportation Plan
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NTUs	nephelometric turbidity units
OHWM	ordinary high water mark
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCEs	primary constituent elements
PES	Preliminary Environmental Study
POD	pelagic organism decline
ppt	parts per thousand
RM	river mile
RSP	rock slope protection
SACOG	Sacramento Area Council of Governments
SCS	Sustainable Communities Strategy
SEL	sound exposure level
SLC	State Lands Commission
SPL	sound pressure level

SP-SM	loose sand with silt
SRA	shaded riverine aquatic
TNW	traditional navigable water
USC	U.S. Code
USCG	U.S. Coast Guard
VELB	valley elderberry longhorn beetle

Chapter 1 Introduction

The purpose of this biological assessment (BA) is to evaluate the effects of the proposed I Street Bridge Replacement Project on species that are federally-listed threatened, endangered, and proposed for threatened or endangered status. This BA is prepared in accordance with legal requirements found in Section 7(a)(2) of the Endangered Species Act (ESA) (16 U.S.C 1536[c]) and based on Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans) regulation, policy, and guidance.

The project is subject to state and federal environmental review requirements because of use of federal Highway Bridge Program (HBP) funds from the FHWA. Accordingly, project documentation is being prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The City of Sacramento is the lead agency under CEQA, with the City of West Sacramento as a responsible agency, and Caltrans is the lead agency under NEPA. NEPA approval is expected to be achieved with an Environmental Assessment. CEQA approval will be achieved with an Environmental Impact Report.

The FHWA's other responsibilities for environmental review, consultation, and any other action required in accordance with applicable federal laws for this project are being, or have been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S. Code (USC) 327.

1.1 Project History and Background

The City of Sacramento, in cooperation with the City of West Sacramento and Caltrans, propose to construct a new bridge over the Sacramento River (approximately river mile [RM] 59.5) between the cities of Sacramento and West Sacramento, approximately 1,000 feet north of the existing I Street Bridge (Figure 1-1). The project limits start within the City of Sacramento and consist of Railyards Boulevard from 200 feet east of Bercut Drive on the east, continuing west over the Sacramento River into the City of West Sacramento along C Street, and terminating approximately 100 feet west of the 5th Street intersection (Figure 1-2). The project limits also extend along Bercut Drive approximately 500 feet north of Railyards Boulevard, along Jibboom Street 550 feet north of Railyards Boulevard and 300 feet south of Railyards Boulevard, along 3rd Street 50 feet north and south of C Street, along 4th Street 50 feet north and south of C Street, along 5th Street 50 feet north and south of C Street, and includes the existing roadway approach structures leading to both sides of the existing I Street Bridge. The total length of the project is approximately 0.42 mile along C Street and Railyards Boulevard. This project is

included in the Sacramento Area Council of Governments (SACOG) 2035 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS).

Constructed in 1911, the existing I Street Bridge is a historic double-deck, steel truss swing bridge. The lower level of the bridge provides rail access across the Sacramento River, while the upper level provides highway and pedestrian access. In 2011, the cities of Sacramento and West Sacramento completed the Sacramento River Crossings Alternatives Study, which identified the purpose and need for new bridge crossings. The study concluded that a North Market Area (the area north of I Street) crossing was needed to replace the existing I Street Bridge, which has lanes that are too narrow to serve buses, lacks bicycle lanes, and has sidewalks that are too narrow to meet accessibility standards.

1.1.1 Purpose and Need

The purpose of the project is to construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge from C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento in order to remove a series of functionally obsolete or structurally deficient bridges, consistent with the adopted findings of the Sacramento River Crossings Alternatives Study for Bridge Location 2 in the North Market Area.

The purpose and objectives of the project are listed below.

- The project should construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge from C Street in the City of West Sacramento to Railyards Boulevard in the City of Sacramento, consistent with the adopted findings of the Sacramento River Crossings Alternatives Study for Bridge Location 2 in the North Market Area.
- The new bridge should meet the requirements of the Neighborhood Friendly Bridge definition that the City of Sacramento City Council adopted by resolution on October 18, 2011, which is defined by the following elements.
  - A facility whose primary function is local connectivity rather than regional travel and primarily serves short local trips.
  - A bridge which serves all users, including motorists, bicyclists, pedestrians, low energy vehicles, and public transit riders.
  - A bridge with aesthetics and dimensions which are architecturally pleasing and contextually appropriate for the adjacent neighborhoods.
  - A bridge that does not exceed or expand the already-planned capacity of the approach roadways (i.e., no widening of approaches just to accommodate bridge flows).

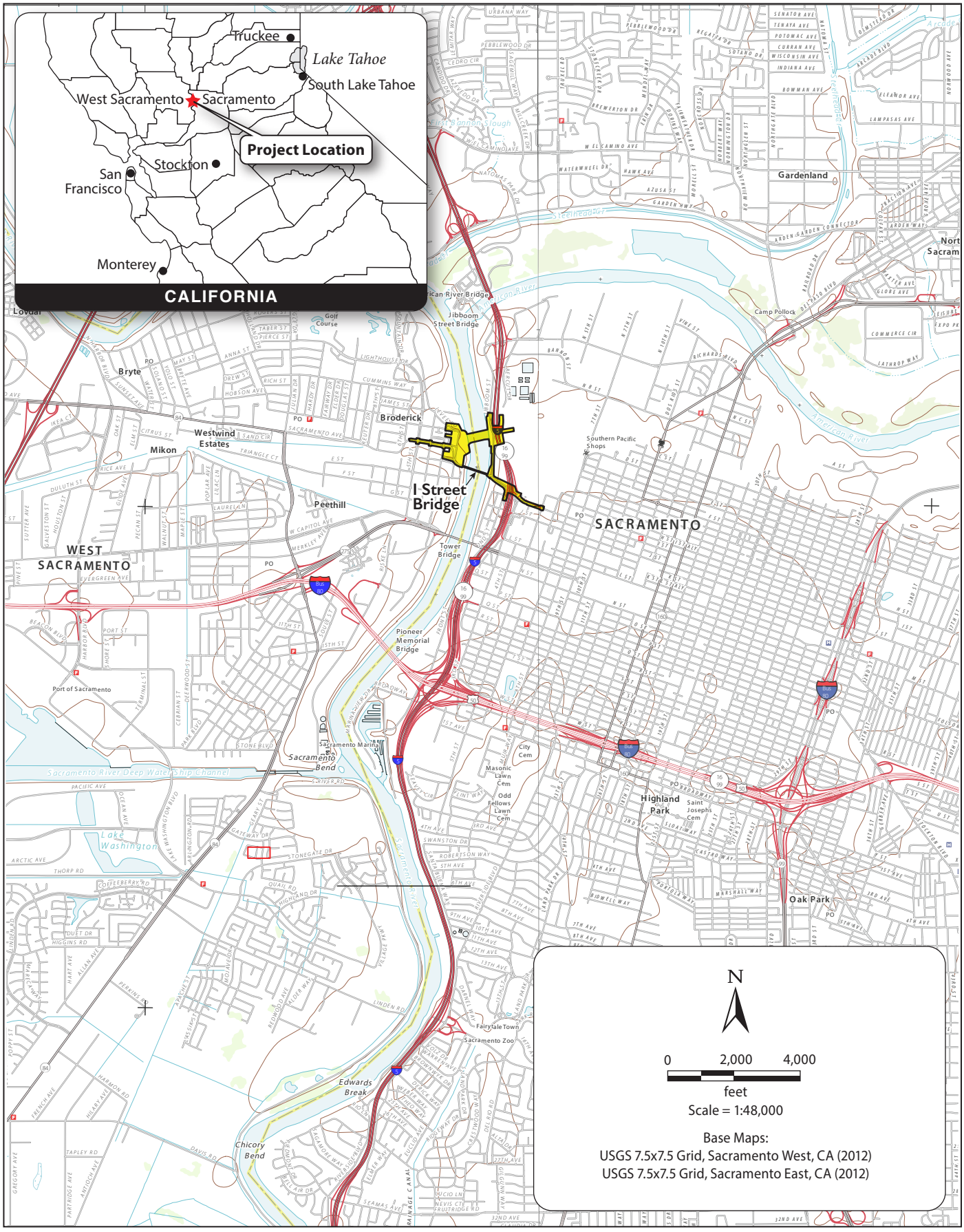

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Figure 1-1
Vicinity Map

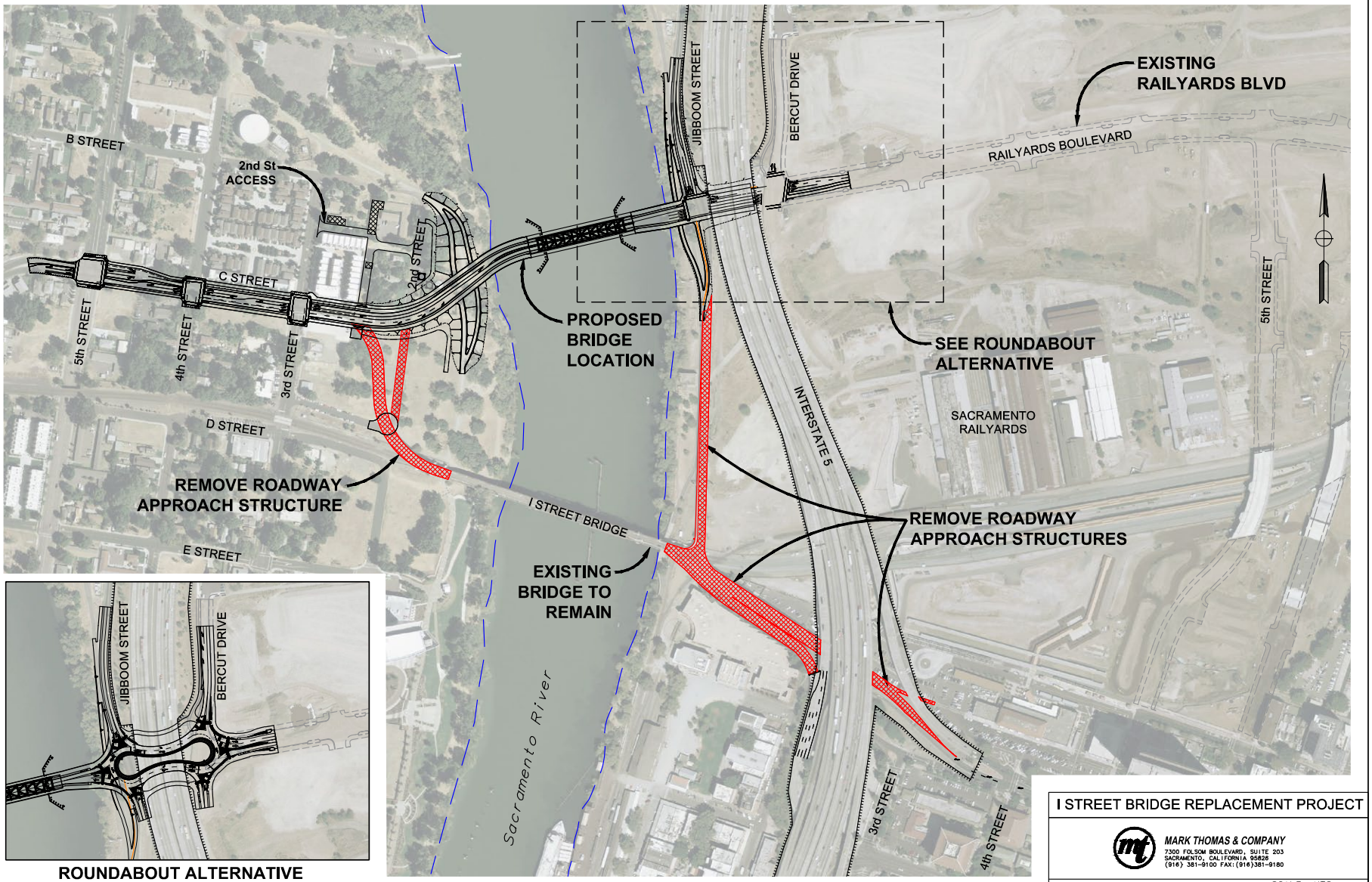

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Figure 1-2
Proposed Project

  - A facility which is designed with a target speed equal to or less than the approach roadways.
  - A bridge which reduces the growth in vehicle miles traveled in the adjacent communities.
  - A bridge that does not connect directly to streets which are primarily residential in character.
  - A bridge that is consistent with the Need and Purpose statement [the adopted Sacramento River Crossings Alternatives Study statement] as articulated.
- In addition to the Neighborhood Friendly Bridge definition, the project should include pedestrian and bicycle facilities in the new public crossing that meet Americans with Disabilities Act (ADA) requirements, and facilitate connections to and from the new crossing and the Sacramento River Parkway and Riverfront Park trails.
- The proposed project also would need to construct a movable bridge that satisfies the vertical clearance and river navigation requirements of the U.S. Coast Guard (USCG).
- The project design should not preclude future addition of a streetcar, a separate, stand-alone project being developed by the Cities of West Sacramento and Sacramento.
- The new bridge also is intended to improve the connectivity to, and accessibility of, businesses, recreational areas, and new or redevelopment opportunity sites located in the urban core of Sacramento and West Sacramento.

The project is needed for the following reasons.

- The existing I Street Bridge does not fully comply with current design and traffic operation standards due to the following conditions.
  - I Street Bridge limits or restricts traffic capacity and multimodal use. The current bridge width is not sufficient to provide adequate traffic operations, bicycle lanes, or the ability for transit service across the bridge.
  - The I Street Bridge and the four associated approach structures are on the federal eligible bridge list for federal funds for replacement and/or rehabilitation through the HBP. The I Street Bridge has been classified as functionally obsolete, and the existing approach structures have been classified as structurally deficient. The Cities of Sacramento and West Sacramento have decided to pursue replacement through the HBP.
- As adopted by the Sacramento City Council, new crossings of the Sacramento River between the City of Sacramento and City of West Sacramento shall be Neighborhood Friendly. In coordination with staff from the City of West Sacramento and SACOG, the definition for a Neighborhood Friendly Bridge was developed by the City of Sacramento and the Sacramento City Council adopted the definition by resolution in October 2011. The

replacement bridge structure is required to be consistent with the Neighborhood Friendly Bridge definition.

- In addition to the Neighborhood Friendly Bridge requirements, lack of ADA compliance, non-standard and non-continuous sidewalks, and lack of bicycle facilities discourage walking and bicycling on the existing I Street Bridge.
- Section 9 of the Rivers and Harbors Act requires any local, state, or federal agency planning to construct a bridge over a navigable waterway to apply for a bridge permit through the USCG. The USCG requires the new bridge to meet or exceed the existing vertical clearance along the river, which is currently set by the US 50 Pioneer Bridge. In order to comply with the Neighborhood Friendly Bridge definition and meet the USCG requirements for navigation clearance, the new bridge would need to be movable.
- The SACOG MTP/SCS identifies that a proposed streetcar would cross over the new bridge from Sacramento to West Sacramento. While the streetcar would be a separate, stand-alone project, the bridge design must not preclude the future addition of a streetcar.
- Limited connectivity to the riverfront reduces the potential to achieve planned urban development and redevelopment of opportunity sites identified in the adopted plans of Sacramento and West Sacramento.

1.2 Project Description

1.2.1 Proposed Project

A new 860-foot-long bridge is proposed to be constructed to the north of the existing I Street Bridge (Figure 1-2). The proposed bridge alignment would connect Railyards Boulevard in the City of Sacramento with C Street in the City of West Sacramento. This alignment also allows the existing I Street Bridge to remain in operation during construction of the new bridge. Once construction of the new bridge is complete, the roadway approach structures leading up to the existing I Street Bridge from both directions would be demolished; however, the existing I Street Bridge would continue to be used by the railroad.

Roadway improvements on Railyards Boulevard in Sacramento and C Street in West Sacramento also are proposed. In the City of Sacramento, the intersection at Jibboom Street and Bercut Drive would be controlled by a signal or consist of a roundabout. In the City of West Sacramento, the proposed C Street alignment would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. To maintain access to these parcels, a new connection to C Street would be constructed approximately 150 feet east of the C Street/3rd Street intersection, and would continue north approximately 300 feet, then make a 90-degree turn, and connect to 3rd Street approximately 300 feet north of C Street.

1.2.1.1 New Bridge Construction and Roadway Modifications

Bridge Construction

The proposed project would construct a new bridge over the Sacramento River. The total bridge length would be approximately 860 feet long, consisting of two vehicle lanes, on-street Class II bike lanes, and sidewalks along both sides of the bridge. The bridge would include two fixed-span approach structures that tie into the Sacramento and West Sacramento banks of the river and are approximately 200 feet and 270 feet in length, respectively (see Figure 1-3). The center span of the bridge would be a movable span that meets the USCG requirements. The movable span is anticipated to be approximately 330 feet in length. The bridge soffit elevation would be set 3 feet above the 200-year water surface elevation to comply with the Central Valley Flood Protection Board (CVFPB) freeboard requirements.

The two fixed-span approach structures would be 72 feet wide, with a superstructure depth (or total bridge thickness) of approximately 6 feet. Each approach structure would be a two-span bridge. The abutment at one end of the structure would be constructed on the banks of the river, a center pier would be placed within the river approximately around the existing bank toe of slope, and the other end of the approach structure would be constructed on the piers for the movable span.

Based on coordination with the USCG, the movable span would provide a 278-foot clear channel opening approximately centered at the middle of the river. As such, the movable span has been identified as a vertical lift bridge, which would raise the bridge to a minimum vertical clearance of 59 feet over the maximum river elevation of 31 feet (measured to the NGVD 29 vertical datum). The truss depth of the movable span would be approximately 40 feet, with 6 feet of the structure being below the bridge deck and 34 feet above the bridge deck. The vertical towers would be approximately 130 feet tall, measured from the bridge soffit elevation. The vertical towers would be approximately 33 feet in thickness and the same width as the bridge deck. The total bridge width on the movable span would be 81 feet.

Due to the existing soil conditions, the bridge would be constructed on deep pile foundations. Table 1-1 summarizes the type and size of piles that would be used during construction of the new bridge, and the depth to which the piles would be installed. The abutments for the fixed-span approach structures at the river bank would consist of approximately 50 piles per abutment that are driven or cast-in-drill-hole (CIDH), to a depth of approximately 70 feet below the original ground elevation. The center piers for the two fixed-span approach structures (located approximately at the bank toe of slope in the river, below the ordinary high water mark) would consist of 50 driven or CIDH piles per pier that are approximately 70 feet below the original ground elevation. If driven piles are selected for either the abutments or piers, the piles would be

precast concrete or steel. The foundations for the movable span would consist of four large-diameter cast-in-steel-shell piles per pier. Each pile would be 9 feet in diameter, extending approximately 140 feet below the original ground elevation, and would be driven with a vibratory hammer and/or with a hydraulic oscillator/rotator system.

Table 1-1. Piles Proposed to Construct I Street Bridge

Pile Location	Pile Diameter/ Type	Total Number of Piles to be Installed	Depth of Installation (feet)	Temporary or Permanent Installation
Abutments 1 and 6	16-in diameter steel 16-in square precast concrete (alternative to 16-in diameter steel above)	100	70	Permanent
Piers 2 and 5	16-in diameter steel 16-in square precast concrete (alternative to 16-in diameter steel above)	100	70	Permanent
Piers 3 and 4	108-in steel casings	8	140	Permanent
Bridge Fender System	16-in diameter concrete	60	30	Permanent
Temporary trestle	16-in diameter steel 16-in H pile (alternative to 16-in diameter steel pile above)	160	70	Temporary
Spud piles	16-in diameter steel	8	40	Temporary
Cofferdams	Sheet piles	180	25	Temporary

Erosion control measures would be installed around the proposed bridge foundations to prevent future scour at the bridge supports. It is anticipated that rock slope protection (RSP) would be installed around the bridge abutments and piers within the water to control erosion.

A bridge fender system also is planned around the movable span piers to protect the piers from errant watercrafts that are navigating along the river. The fender system would include approximately 30 driven concrete or wooden piles around each of the movable span piers (Table 1-1). The piles would be driven to a depth of approximately 30 feet below the original ground elevation.

Temporary Falsework and Cofferdams

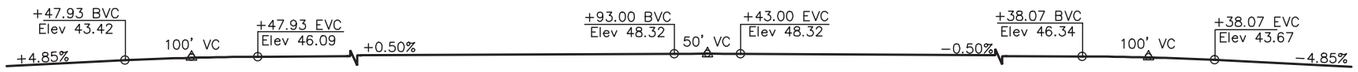
Temporary falsework platforms (trestles) would be required to construct the proposed bridge foundations and approach structures. The platforms would be constructed during the first construction season using temporary piles within the river. Each temporary platform would include approximately 80 driven steel piles; the piles would be either 16-inch diameter or 16-inch H piles (Table 1-1). Once installed, the temporary trestle piles would remain in the river throughout the duration of construction and would be removed in the second construction season following completion of construction. In addition, temporary cofferdams would be required to construct piers 2 and 5 for the new bridge, which would be within the water. The cofferdams

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
03	YOL/SAC	"C"/"RY"	N/A

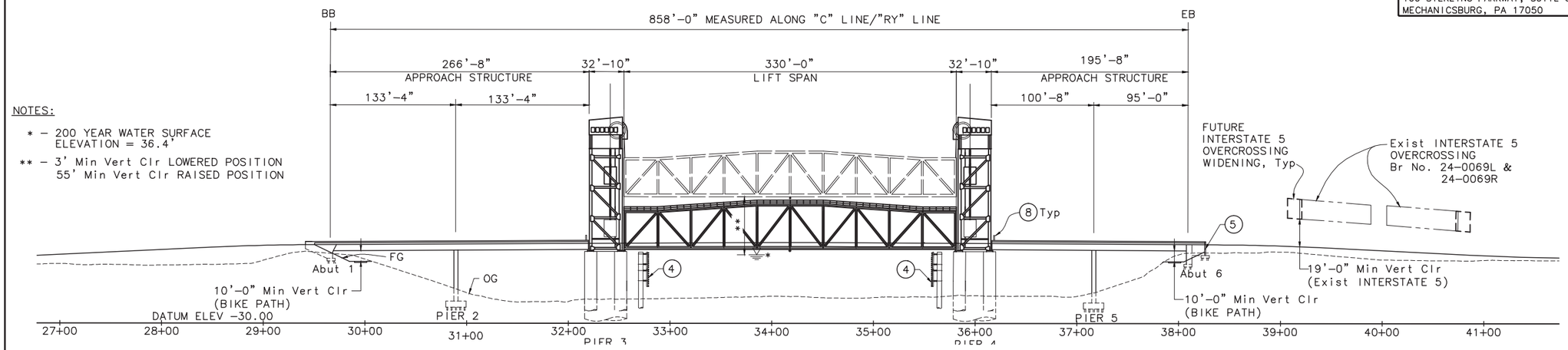
CITY OF SACRAMENTO
DEPARTMENT OF PUBLIC WORKS
915 I STREET, ROOM 2000
SACRAMENTO, CA 95814

MARK THOMAS & COMPANY, INC.
7300 FOLSOM BLVD., SUITE 203
SACRAMENTO, CA 95826

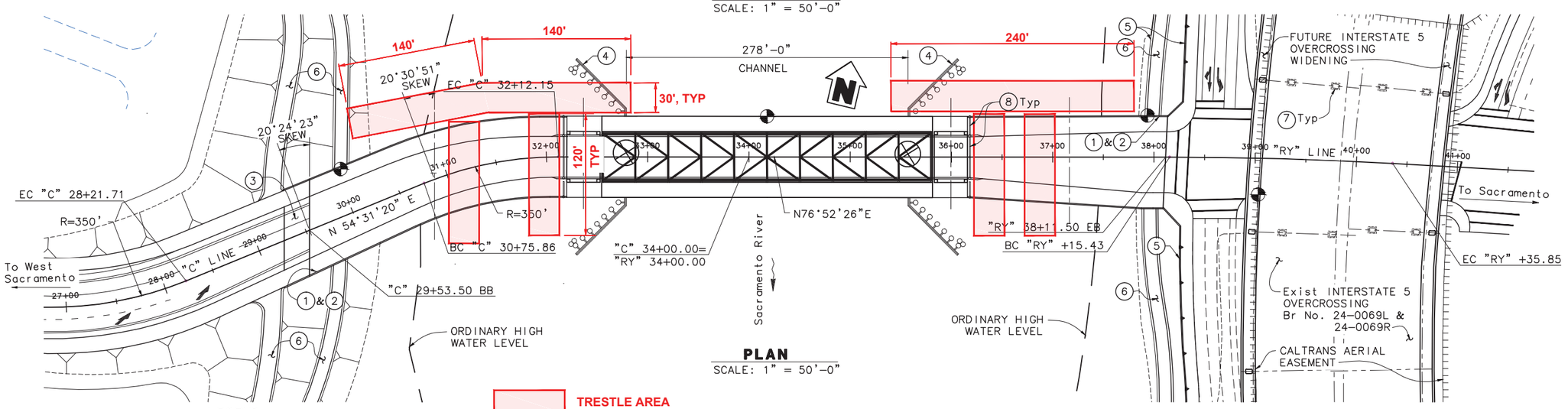
MODJESKI AND MASTERS, INC.
100 STERLING PARKWAY, SUITE 302
MECHANICSBURG, PA 17050



PROFILE GRADE
NO SCALE



ELEVATION
SCALE: 1" = 50'−0"



PLAN
SCALE: 1" = 50'−0"

TRESTLE AREA

LEGEND:

- POINT OF MINIMUM VERTICAL CLEARANCE
- USCG GPS TARGET LOCATION
- (1) PAINT BRIDGE NAME
- (2) PAINT BRIDGE NUMBER
- (3) APPROACH SLAB
- (4) FENDER SYSTEM
- (5) RETAINING WALL
- (6) BIKE PATH
- (7) ISOLATION CASING AROUND EXISTING BRIDGE COLUMNS
- (8) TRAFFIC/PEDESTRIAN GATE & WARNING SIGNAL

X
DESIGN OVERSIGHT
X
SIGN OFF DATE

DESIGNED BY	J. HICKEY	DATE	03−20−15
DRAWN BY	J. DOTY	DATE	03−20−15
CHECKED BY	T. PHAM	DATE	03−20−15
APPROVED	E. FREDRICKSON	DATE	03−20−15

E. FREDRICKSON
PROJECT ENGINEER

ALTERNATIVE 1
PLANNING STUDY
I STREET BRIDGE (REPLACE)

BRIDGE NO. XXX	UNIT:
SCALE: AS SHOWN	PROJECT NUMBER & PHASE: 03−XXXXXX

CONTRACT NO.: X
PROJECT ID: 00000000000

ADVANCE PLANNING STUDY SHEET (ENGLISH) (REV. 7/16/10)
FILE => I STREET TRESTLE EXHIBIT.DWG
DATE PLOTTED => 10−Jul−15 TIME PLOTTED => 10:41 AM
USERNAME => JDOTY
Graphics... 00203.14 (7/13/15) AB

Figure 1-3
Proposed I Street Bridge: Plan View, Profile, and Elevation

would consist of temporary sheet piles installed around the individual piers. The sheet piles would be installed and removed with a vibratory hammer. Dewatering inside the cofferdams would be required.

Bridge Construction Sequence

Figure 1-4 shows the sequencing of construction activities. All in-water work would be conducted between May 1 and November 30 during the two construction seasons. This schedule is intended to reduce the number of construction seasons to construct the bridge, while minimizing or avoiding construction effects on sensitive fish and wildlife species.

1.2.1.2 Roadway Modifications

City of Sacramento

In Sacramento, Railyards Boulevard would be extended west over the Sacramento River. East of Bercut Drive, Railyards Boulevard would consist of two westbound lanes and one eastbound lane. Between Jibboom Street and Bercut Drive, Railyards Boulevard would consist of two westbound lanes and three eastbound lanes with a signalized intersection at Jibboom Street and Bercut Drive, or consist of a roundabout with two lanes in each direction. West of the Jibboom Street intersection, Railyards Boulevard would consist of one lane in each direction.

Bercut Drive would be modified from Railyards Boulevard north approximately 500 feet. Bercut Drive would be designed to have two northbound lanes at the Railyards Boulevard intersection, tapering down to one northbound lane at the northern project limits, and one southbound lane. Improvements to Bercut Drive south of Railyards Boulevard are not part of, nor needed for, the proposed project and would be constructed if needed as part of a separate future project.

Proposed improvements on Jibboom Street would extend 550 feet north of Railyards Boulevard. The roadway would consist of one travel lane in each direction, on-street Class II bike lanes, sidewalk along the west side of the roadway, and retaining walls of various heights along both sides of the road. Extension of Jibboom Street south of Railyards Boulevard is not included with, nor needed for, the proposed project and would be constructed if needed as part of a separate future project.

The proposed roadway profile for Railyards Boulevard would be approximately 6 feet higher than the original ground elevation at the Jibboom Street intersection. The profile adjustment is needed in order to satisfy the CVFPB requirements to provide 3 feet of clearance between the 200-year-flood water surface elevation and the bridge soffit (or low chord of the bridge).

City of West Sacramento

The new C Street alignment would cut off access to four residential parcels and one multifamily parcel located along 2nd Street, north of C Street. The new alignment would connect to C Street approximately 150 feet east of the 3rd Street intersection and continue north approximately 300 feet. This new alignment would then make a 90-degree left turn and connect to 3rd Street approximately 300 feet north of C Street. This new alignment would require right-of-way acquisition from seven individual parcels and removal of three structures. One structure is located on APN 010-101-010 and appears to be an individual residence. Another structure is located on APN 010-101-013 and appears to be an apartment building that supports up to one individual apartment. The last structure is located on APN 010-101-004 and appears to be an individual residence.

Between the bridge touchdown location along C Street in West Sacramento and the 4th Street/ C Street intersection, the roadway would consist of one westbound travel lane, two eastbound travel lanes (the two eastbound travel lanes would taper down to one eastbound lane east of the 3rd Street intersection), a center left-turn lane, on-street Class II bike lanes, on-street parking along the north side of the roadway, and sidewalks along both sides of the roadway. As the roadway through this section currently consists of the proposed number of travel lanes, the widening through this area is primarily needed to support the Class II bike lanes and wider sidewalks.

Along C Street between 4th Street and 5th Street, the roadway would consist of one travel lane in each direction, left-turn lanes, on-street Class II bike lanes, and sidewalks along both sides of the road. All of the improvements through this section would be accommodated within the existing roadway limits.

1.2.1.3 Class I Bikeway and Levee Modifications and Improvements

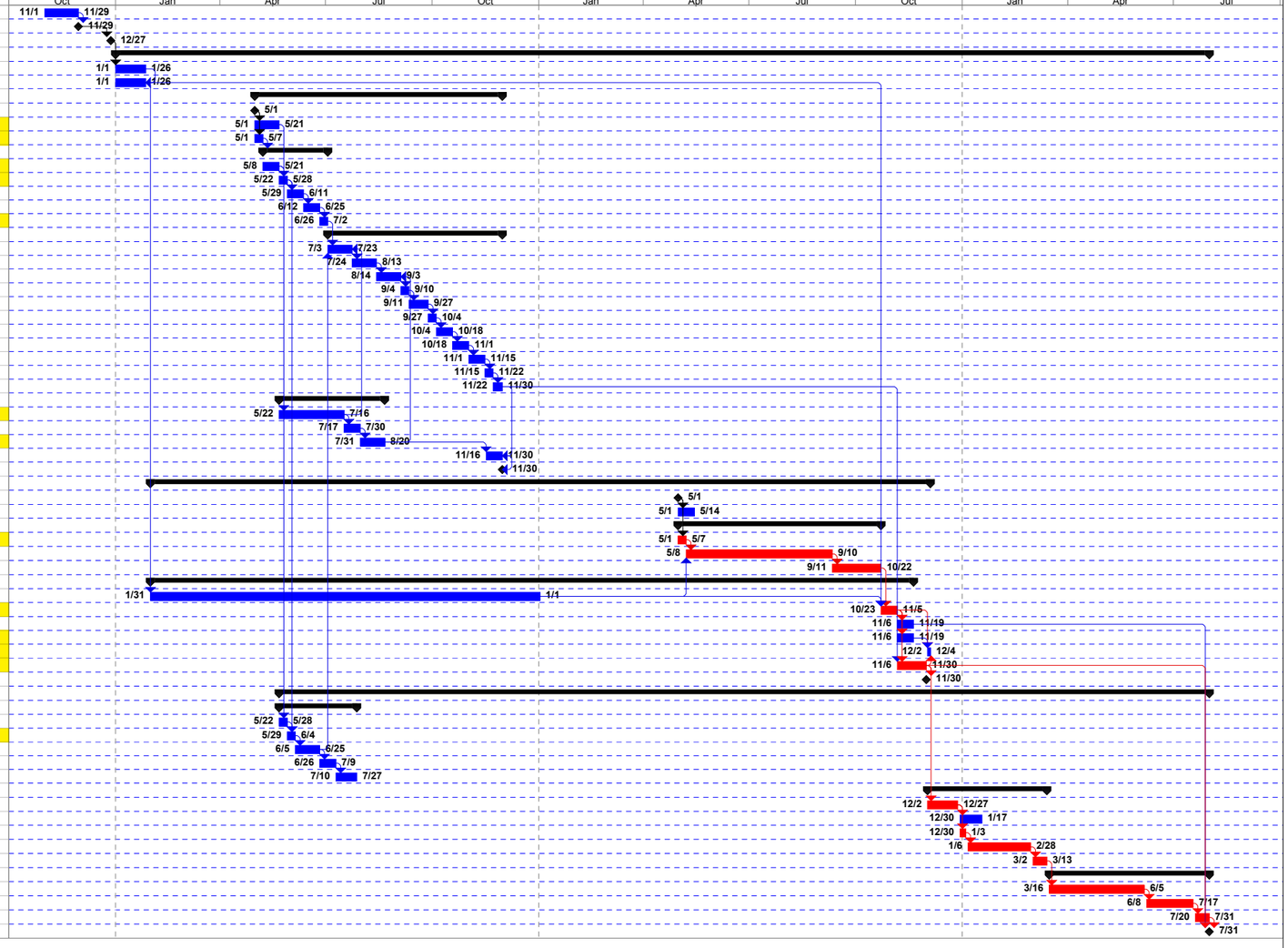
City of Sacramento

The existing Class I Sacramento River Parkway along Jibboom Street would be reconstructed approximately 500 feet north and 300 feet south of Railyards Boulevard as part of the proposed project. In order to maintain a continuous off-street Class I path along this section, the path would be grade-separated under the proposed bridge structure. Cyclists and pedestrians approaching Railyards Boulevard in either direction would have the option to continue along the path under the new structure, avoiding the need to cross the roadway. Cyclists and pedestrians who are traveling along the path also would have the option to connect to Railyards Boulevard and cross over the proposed bridge into West Sacramento or turn east into Sacramento. Due to the limited horizontal clearance between the river and the Interstate 5 (I-5) viaduct structure, retaining walls would be needed along the path to account for the vertical elevation difference

I Street Bridge Replacement Construction Schedule

7-Day Work Week

ID	Task Name	Duration	Start	Finish	Predecessors	Successors
1	Advertise	21 days	Wed 11/1/17	Wed 11/29/17		2
2	**Bid Opening**	**0 days**	**Wed 11/29/17**	**Wed 11/29/17**	**1**	**3FS+4 wks**
3	**Award**	**0 days**	**Wed 12/27/17**	**Wed 12/27/17**	**2FS+4 wks**	**5**
4	**Working Days**	**675 days**	**Mon 1/1/18**	**Fri 7/31/20**		
5	Submittals/Shop Drawings	4 wks	Mon 1/1/18	Fri 1/26/18	3	6FF
6	Mobilize	4 wks	Mon 1/1/18	Fri 1/26/18	5FF	43,44
7	**In Water Work Season 1**	**153.5 days**	**Tue 5/1/18**	**Fri 11/30/18**		
8	**In Water Work Begins**	**0 days**	**Tue 5/1/18**	**Tue 5/1/18**		**9,10**
9	Install Temp Constr Trestle From Bank to Piers	3 wks	Tue 5/1/18	Mon 5/21/18	8	30
10	Setup Barge	1 wk	Tue 5/1/18	Mon 5/7/18	8	11
11	**Pier 2&5 Work**	**40 days**	**Tue 5/8/18**	**Mon 7/2/18**	**10**	
12	Cofferdam and Dewatering	2 wks	Tue 5/8/18	Mon 5/21/18		13,52
13	Pier 2&5 Pile Driving	1 wk	Tue 5/22/18	Mon 5/28/18	12	14,53
14	Form/Pour Pier 2&5 Pile Cap	2 wks	Tue 5/29/18	Mon 6/11/18	13	15
15	Pier 2 & 5 Column Construction	2 wks	Tue 6/12/18	Mon 6/25/18	14	16
16	Remove Cofferdam & Place Rock Slope Protection	1 wk	Tue 6/26/18	Mon 7/2/18	15	18
17	**Approach Superstructure**	**108.5 days**	**Tue 7/3/18**	**Fri 11/30/18**		
18	Erect Falsework & Soffit	3 wks	Tue 7/3/18	Mon 7/23/18	30FF,54,16	19
19	Form Exteriors, Overhangs	3 wks	Tue 7/24/18	Mon 8/13/18	18	20
20	Rebar and Soffit Stems	3 wks	Tue 8/14/18	Mon 9/3/18	19,32FF	21
21	Install PT Ducts	1 wk	Tue 9/4/18	Mon 9/10/18	20	22
22	Form, Pour Soffit & Stems	2.5 wks	Tue 9/11/18	Thu 9/27/18	21	23
23	Strip Stems & Lost Deck	1 wk	Thu 9/27/18	Thu 10/4/18	22	24
24	Place Lost Deck	2 wks	Thu 10/4/18	Thu 10/18/18	23	25
25	Deck Rebar & Pour	2 wks	Thu 10/18/18	Thu 11/1/18	24	26
26	Deck Cure	2 wks	Thu 11/1/18	Thu 11/15/18	25	27
27	Stress & Grout Bridge	1 wk	Thu 11/15/18	Thu 11/22/18	26	28
28	Remove Falsework	6 days	Thu 11/22/18	Fri 11/30/18	27	48,33FF
29	**Pier 3&4 Work**	**65 days**	**Tue 5/22/18**	**Mon 8/20/18**		
30	Vibrate/Drive 108-in Casings	8 wks	Tue 5/22/18	Mon 7/16/18	9	31,18FF
31	Set Cage & Cast 108-in Piles	2 wks	Tue 7/17/18	Mon 7/30/18	30	32
32	Form/Pour Cap for Shafts & Place Rock Slope Protect	3 wks	Tue 7/31/18	Mon 8/20/18	31	20FF,33
33	Remove Portion of Trestle (Leave Piles in Place)	2 wks	Fri 11/16/18	Fri 11/30/18	32,28FF	34FF
34	**In Water Work Ends Season 1**	**0 days**	**Fri 11/30/18**	**Fri 11/30/18**	**33FF**	
35	**In Water Work Season 2**	**480.5 days**	**Wed 1/31/18**	**Wed 12/4/19**		
36	**In Water Work Begins**	**0 days**	**Wed 5/1/19**	**Wed 5/1/19**		**37,39**
37	Install Temp Constr Trestle (except piling)	2 wks	Wed 5/1/19	Tue 5/14/19	36	
38	**Pier 3&4 Work**	**125 days**	**Wed 5/1/19**	**Tue 10/22/19**		
39	**Setup Barge**	**1 wk**	**Wed 5/1/19**	**Tue 5/7/19**	**36**	**40**
40	**Erect Vertical Lift Towers**	**18 wks**	**Wed 5/8/19**	**Tue 9/10/19**	**39,43**	**41**
41	**Install and Test Bridge Operating Equipment**	**6 wks**	**Wed 9/11/19**	**Tue 10/22/19**	**40**	**44**
42	**Lift Span**	**470 days**	**Wed 1/31/18**	**Tue 11/19/19**		
43	Construct Vertical Lift Span (Offsite)	8.57 mons	Wed 1/31/18	Tue 1/1/19	6	40,44
44	**Float in Lift Span & Erect**	**2 wks**	**Wed 10/23/19**	**Tue 11/5/19**	**6,41,43**	**45,47,48,46**
45	Make Lift Span Operational	2 wks	Wed 11/6/19	Tue 11/19/19	44	67
46	Install Fender System & Piles	2 wks	Wed 11/6/19	Tue 11/19/19	44	47
47	Remove Barge	0.5 wks	Mon 12/2/19	Wed 12/4/19	44,46,48	
48	**Remove Trestle & Piles**	**18 days**	**Wed 11/6/19**	**Sat 11/30/19**	**28,44**	**67,58,49,47**
49	**In Water Work Ends Season 2**	**0 days**	**Sat 11/30/19**	**Sat 11/30/19**	**48**	
50	**Out of Water Work**	**574 days**	**Tue 5/22/18**	**Fri 7/31/20**		
51	**Construct Abut 1/6**	**49 days**	**Tue 5/22/18**	**Fri 7/27/18**		
52	Excavate Abutment	1 wk	Tue 5/22/18	Mon 5/28/18	12	53
53	Drive Abut Piles	1 wk	Tue 5/29/18	Mon 6/4/18	52,13	54
54	Pour Abut	3 wks	Tue 6/5/18	Mon 6/25/18	53	55,18
55	Backfill Abutment	10 days	Tue 6/26/18	Mon 7/9/18	54	56
56	Approach Slabs	14 days	Tue 7/10/18	Fri 7/27/18	55	
57	**Approach Superstructure**	**75 days**	**Mon 12/2/19**	**Fri 3/13/20**		
58	**Barriers, Median**	**4 wks**	**Mon 12/2/19**	**Fri 12/27/19**	**48**	**59,60**
59	Lighting	3 wks	Mon 12/30/19	Fri 1/17/20	58	
60	**Joint Seals**	**1 wk**	**Mon 12/30/19**	**Fri 1/3/20**	**58**	**61**
61	**Finalize Roadway Conforms**	**8 wks**	**Mon 1/6/20**	**Fri 2/28/20**	**60**	**62**
62	**Punch List**	**2 wks**	**Mon 3/2/20**	**Fri 3/13/20**	**61**	**64**
63	**Demo Existing Approach Structures**	**100 days**	**Mon 3/16/20**	**Fri 7/31/20**		
64	**Demo Existing Approach Structures**	**12 wks**	**Mon 3/16/20**	**Fri 6/5/20**	**62**	**65**
65	**Cleanup**	**6 wks**	**Mon 6/8/20**	**Fri 7/17/20**	**64**	**66**
66	**Punch List**	**2 wks**	**Mon 7/20/20**	**Fri 7/31/20**	**65**	**67**
67	**Project Completion**	**0 days**	**Fri 7/31/20**	**Fri 7/31/20**	**48,45,66**	



Project: I Street Bridge Replacement Construction Schedul
Date: Wed 2/10/16

Task	Rolled Up Task	Split	Inactive Task	Duration-only	Finish-only		
Critical Task	Rolled Up Critical Task	External Tasks	Inactive Milestone	Manual Summary Rollup	Progress		
Milestone	Rolled Up Milestone	Project Summary	Inactive Summary	Manual Summary	Deadline		
Summary	Rolled Up Progress	Group By Summary	Manual Task	Start-only	Construction Activities with In-Water Effects		

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Figure 1-4
Construction Schedule

between Jibboom Street and the path that continues under the proposed bridge structure. The maximum retaining wall height along the bike path would be 16 feet.

City of West Sacramento

The proposed project would require improvements to the existing levee along the West Sacramento side of the river, where the proposed bridge alignment would connect to C Street. The existing levee does not meet current standards required by Title 23 of the California Code of Regulations (CCR). Extending approximately 300 feet north and south of the proposed C Street alignment, the levee cross-section would be reconstructed to meet current design standards, which would require 3:1 side slopes on the landside and waterside of the levee, and a 20-foot-wide crown at the top of the levee. The levee improvements also would include a slurry cutoff wall extending to a depth of 110 feet below the original ground elevation. In addition, the proposed roadway profile would be approximately 6 feet higher than the original ground elevation as it crosses over the levee. In order to maintain access to the levee for inspection and maintenance services, access roads would be constructed from the new roadway to the top of the improved levee section. The proposed grading for the levee would require relocation of the existing water tower that is located along 2nd Street, just north of the proposed C Street alignment. The tower would be relocated to the northwest, approximately 43 feet from its existing location.

The new levee maintenance road also would serve as the future Class I River Walk Park trail extension in West Sacramento. Similar to the trail improvements proposed as part of the project in Sacramento, the trail would be grade-separated under the proposed bridge structure. Cyclists and pedestrians approaching C Street in either direction would have the option to continue along the trail under the new structure, avoiding the need to cross the roadway. Cyclists and pedestrians who are traveling along the trail also would have the option to connect to C Street to cross over the proposed bridge into Sacramento or head west on C Street.

1.2.2 Over-Water Construction-Site Access

Temporary trestles and barges would be used to provide the contractor with access to the river portion of the project area. Together, the trestles and barges would be used to stage construction materials, provide a working platform for cranes, and for general construction support. The temporary trestles would consist of steel piles that would be driven into place with an impact hammer. Although the temporary work platforms would be removed at the end of the first construction season before the onset of winter, the temporary trestle piles would remain in place for the duration of construction. The barges would be anchored to the river bottom with spud piles that would be driven into place with an impact hammer. Up to two barges would be anchored in the river at one time. The barges would be repositioned in the channel throughout

construction only as needed to complete the work. The barges would be removed after bridge construction is completed.

1.2.3 In-Water Construction Activities

In-water construction activities consist of those construction activities below the ordinary high water mark (OHWM). These activities would be limited to the period of May 1 to November 30 during the two construction seasons. This in-water construction window allows sufficient time for most in-water work to be completed within the first "in-water work season", thus limiting the potential impacts on fish and other species from these activities to primarily one construction season. This in-water work window was selected after consideration of agency in-water work restrictions, timing of presence of multiple special-status fish species, timing of breeding seasons for other special-status species in the project area, and other constraints. Other construction activities occurring above the OHWM (e.g., work on the abutments and approach superstructure, and demolition of existing approach structures) would not be limited to the in-water window of May 1 to November 30. Additional information on sequencing of construction activities is provided in Figure 1-4.

In-water construction activities would include the following.

- Installation and removal of 160 steel piles with an impact hammer for the temporary falsework platforms (trestles). The piles would be embedded approximately 70 feet below the original ground elevation, based on preliminary engineering and site analysis.
- Installation and removal of eight steel spud piles with an impact hammer for anchoring barges. The piles would be embedded approximately 40 feet into the substrate, based on preliminary engineering and site analysis.
- Installation of steel sheet piles with a vibratory driver for temporary cofferdams;
- Installation of 100 steel piles for piers 2 and 5 with an impact hammer for the new bridge (although work would occur within dewatered cofferdams, underwater sound would propagate beyond the dewatered cofferdams). The piles would be embedded approximately 70 feet into the substrate, based on preliminary engineering and site analysis.
- Installation of eight 108-inch-diameter steel casings for piers 3 and 4 with a vibratory hammer and/or hydraulic oscillator/rotator system for the new bridge. The piles would be embedded approximately 140 feet into the substrate, based on preliminary engineering and site analysis.
- Installation of 30 concrete piles with an impact hammer for the new bridge fender system. The piles would be embedded approximately 30 feet into the substrate, based on preliminary engineering and site analysis.

- Installation of RSP at piers 2–5 to prevent erosion.

To reduce the potential for effects on fish during pile driving, the City and/or its contractors will implement several mitigation measures (described in detail in Chapter 4), as well as the following best management practices (BMPs) to further avoid and minimize effects that may arise during the placement and driving of piles and temporary sheet piles for cofferdams, if needed. The cofferdams would be removed once pier column construction is completed.

- Bubble curtains will be installed around piles during impact driving and proofing operations to dampen underwater sound shockwaves (Figure 1-5).
- The construction contractor will conduct several dry or dead blows with the hammer initially to frighten fish away from the pile before the pile is driven or proofed with an impact pile driver. Implementation of several dry or dead blows with the hammer to initially frighten fish away is being proposed because the use of a cushioning block or similar feature would result in more strikes being needed to drive the piles, thereby resulting in a greater chance of exceeding the cumulative sound exposure levels (SELs) without significantly reducing peak SELs.

Figure 1-5. Example of an Unconfined Bubble Curtain and Supporting Frame
(Source: Caltrans 2009)

1.2.4 Above-Water Construction Activities

After the temporary cofferdams are installed around piers 2 and 5, forms would be constructed and concrete poured in the dewatered cofferdams to construct the pile caps. Work would then focus on pier 2 and 5 column construction. After the 108-inch-diameter casings for piers 3 and 4 are installed, a rebar cage would be placed into the pile and concrete would be poured into the steel shell. A cast-in-place concrete pier cap would be placed atop the columns to serve as the substructure.

Work would then focus on constructing the approach superstructure and vertical lift towers. The removable span would be constructed off-site, floated in, and erected once construction of the vertical lift towers is completed.

1.2.5 Storm Water Drainage Management

Drainage for the proposed roadway would be conveyed to the existing storm drain system installed within Railyards Boulevard and C Street. Railyards Boulevard currently drains storm water to the east along the roadway and then into a retention basin south of Railyards Boulevard. C Street drains storm water west along the roadway and then ultimately south beyond the project limits.

As is standard with all construction projects, the contractor would be required to install temporary BMPs to control any runoff or erosion from the project site into the surrounding waterways. These temporary BMPs would be installed prior to any construction operations and would be in place for the duration of the contract. The removal of these BMPs would be the final operation, along with project site cleanup.

1.2.6 Structure Demolition and Roadway Modifications

Following completion of the new bridge connections at Railyards Boulevard and C Street, traffic would be diverted to the new bridge, and the four existing approach structures to the I Street Bridge would be removed. Bridge numbers 24C0364L, 24C0364R, 22-0033, and 22C0154 would be demolished and the foundations would be removed to a depth of 3 feet below the original ground elevation. Encroachment permits from Caltrans and Union Pacific Railroad would be needed to complete the bridge removal. The existing I Street Bridge is owned and operated by Union Pacific Railroad and would continue to remain in-place and used by trains following construction of the new bridge.

As part of the removal of the existing approach structures, the project would include modifications to I Street within the City of Sacramento from the southbound I-5 on-ramp east to the 5th Street intersection. The modification would include signing and striping revisions,

demolition of existing roadway sections that are no longer required, and removal of bridge abutments and foundations.

1.2.7 Staging, Storage, and Proposed Access during Construction

Two staging areas would be used to store materials and equipment during construction, such as pipe materials, precast manholes and drop inlets, steel girders, piles, and rebar, along with the construction equipment when not in use. One area would be located south of Railyards Boulevard under I-5 in Sacramento; the other area would be located west of the landward side of the levee, south of the new bridge location in West Sacramento. The staging area located along Railyards Boulevard would be accessed via the existing intersection at Jibboom Street. The staging area in West Sacramento would be accessed via the existing 2nd Street connection at 3rd Street, south of C Street. The staging areas would be in use throughout the construction duration; the areas would be returned to their pre-project conditions at the completion of the project.

1.2.8 Utility Relocations

A number of public and private utilities would need to be relocated or adjusted to grade as part of the project, including existing water, sewer, gas, electric, and communication facilities within Jibboom Street, Bercut Drive, C Street, and 2nd Street.

1.2.9 Traffic Management and Detours during Construction

While most of the project would be constructed outside of existing roadways, some areas would require temporary detours or staged construction.

Along Jibboom Street at the proposed Railyards Boulevard intersection, the new roadway profile would be raised approximately 6 feet above the original ground elevation. To maintain access to the existing Jibboom Street viaduct south of Railyards Boulevard during the roadway construction, a temporary access road would be needed. The proposed temporary access road would connect to the existing Jibboom Street viaduct abutment approximately 350 feet south of Railyards Boulevard. The temporary road would then continue under I-5 and connect to the Railyards Boulevard/Bercut Drive intersection. The temporary road would require placement of temporary fill material and a roadway structural section that would be removed after construction of the new bridge. Traffic traveling north along Jibboom Street would continue north along Bercut Drive to access the Richards Boulevard/I-5 interchange.

In order to complete the improvements at Jibboom Street and Railyards Boulevard, Jibboom Street would be closed to traffic approximately 600 feet north of Railyards Boulevard. Traffic traveling south along Jibboom Street to continue over the existing I Street Bridge into West

Sacramento would be detoured over to Bercut Drive at Richards Boulevard. Traffic would then use the temporary access road to connect to the Jibboom Street viaduct structure. The temporary access road would be in place for approximately 2 years, after which traffic would use the new roadways and new bridge.

The Sacramento River Parkway trail along Jibboom Street also would require temporary re-routing during construction. The temporary alignment for the trail would follow the temporary Jibboom Street alignment south of Railyards Boulevard. Cyclists and pedestrians would then continue following a detour north along Bercut Drive to Richards Boulevard, where they could then connect back to the Parkway on the west side of I-5. The detour would be in place for approximately 2 years.

During construction, traffic along C Street would be maintained along the existing approach structure until the new bridge is constructed.

1.2.10 Project Construction Sequence

New bridge and roadway construction would occur first, followed by demolition of the four approach structures that connect to the existing I Street Bridge. Once the new bridge and roadways are constructed, traffic would be diverted to the new bridge in order to allow demolition adjacent to the existing bridge. Construction of the project is expected to take approximately 30 months.

1.2.11 Property Acquisition

The project would require temporary and permanent property acquisitions along C Street, 3rd Street, and 2nd Street within the City of West Sacramento and along Railyards Boulevard, Jibboom Street, Bercut Drive, and I Street within the City of Sacramento.

Along C Street, temporary and permanent acquisitions would be required along the south side of the roadway to accommodate the construction of standard shoulders, bike lanes, and sidewalks—from the intersection of 4th Street to the Sacramento River.

Along 3rd Street and 2nd Street, temporary and permanent acquisitions would be needed from the Union Pacific Railroad on the south, to just north of the B Street intersections, for construction of the proposed roadway and levee improvements.

Along Railyards Boulevard, Jibboom Street, and Bercut Drive, temporary and permanent acquisition would be needed from the current state-owned right-of-way for I-5, for construction

of the roadway. In addition, temporary and permanent acquisitions would be needed along Jibboom Street for the proposed temporary detour road and Class I bikeway improvements.

Temporary acquisition would be required along the existing I Street connection to facilitate removal of the existing viaduct structures. Due to the limited space available in Old Sacramento, it is anticipated that construction activities would occur from the parking lot at the intermodal station.

1.2.12 Proposed Equipment and Construction Schedule

Table 1-2 identifies the type of equipment that would be used to construct the project. Construction is expected to begin in spring 2018 and occur during three (two in-water) construction seasons. It is anticipated that the project would be completed by mid-summer 2020.

1.3 Summary of Consultation to Date

During preparation of this BA, ICF International (ICF) (formerly Jones & Stokes) coordinated with the USFWS. Coordination with the agency occurred during a meeting and a visit to the project site on November 17, 2015. Discussions focused on potential effects on federally listed species, the construction schedule and timing of activities, and avoidance, minimization, and compensation measures. A detailed summary of this coordination is included in the "Agency Coordination" section in Chapter 2.

A list of federally endangered and threatened species, and designated critical habitat that have the potential to occur in the project vicinity, was obtained from the Sacramento USFWS website on April 17, 2015, and an update of this list was obtained from the IPaC website on January 26, 2016 (Appendix A).

Table 1-2. Construction Phases and Equipment

Phase	Equipment	Number per Day
Grubbing/Land Clearing	Excavators	4
	Crawler Tractors	2
Excavation	Scrapers	2
	Front End Loader	2
	Excavators	4
	Dump Truck	20
Embankment	Graders	2
	Drill Rig Truck	2
	Impact Pile Driver	2
	Compactor	2
	Rubber Tired Loaders	2
	Roller	2
	Water Truck	2
Drainage/Utilities/ Sub-Grade	Air Compressor	3
	Generator	3
	Graders	2
	Rough Terrain Forklift	2
	Tractors/Loaders/Backhoes	6
Sub Base	Scraper	2
	Dump Truck	20
	Excavator	2
Levee	Excavator	2
	Slurry Plant	1
	Slurry Trenching	1
Paving	Pavers	1
	Street Sweeper	1
	Paving Equipment	1
	Tractors/Loaders/Backhoes	3
	Rollers	2
Bridge Demo	Hoe Ram	4
	Pneumatic Tools	4
	Chipping Gun	4
	Shears	1
Pile Installation	Impact Pile Driver	2
	Vibratory or Oscillating Pile Drive	2
	Water Pump	2
	Barge	1
	Tug Boat	1
	Crane	1
Concrete Placement	Concrete Truck	18
	Concrete Pump	2
	Welder / Torch	2
	Sand Blaster	2
	Painting	2
Tug boat operations	Tug Boat	1

1.4 Document Preparation History

This BA was prepared for the proposed project during 2016 by ICF. Preparers of the document included wildlife biologist John Howe (valley elderberry longhorn beetle) and fish biologist Jeff Kozlowski (delta smelt). Wildlife biologist Jennifer Haire conducted peer/technical review of the BA. Overall review was conducted by ICF project manager Claire Bromund. Caltrans biologist Jennifer Osmondson reviewed and provided comments on the BA.

ICF prepared a wetland delineation report for the proposed project during 2015. ICF botanist/wetland ecologist. Lisa Webber conducted the wetland delineation and prepared the report and overall review was conducted by Claire Bromund. Caltrans biologist Jennifer Osmondson reviewed and provided comments on the wetland delineation report. The wetland delineation report is provided in Appendix B.

Chapter 2 Study Methods

2.1 Listed and Proposed Species Potentially in the Biological Study Area

A list of federally endangered and threatened species, and designated critical habitat that have the potential to occur in the project vicinity was obtained from the Sacramento USFWS and IPaC websites for the project area (U.S. Fish and Wildlife Service 2015a, 2016) (Appendix A).

Table 2-1 includes the potential for each listed species to occur in the BSA. Information collected during field surveys, review of existing documents and the California Natural Diversity Database (CNDDB) (California Department of Fish and Wildlife 2015), presence of suitable habitat, and professional judgment were used to determine potential presence of the federally listed species evaluated in this BA.

As shown in Table 2-1, the BSA contains suitable habitat for valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (VELB) and delta smelt (*Hypomesus transpacificus*). The BSA also occurs within designated critical habitat for delta smelt. There is no suitable habitat in the BSA for, or the BSA is outside the known range of, the remaining species listed in Table 2-1.

A separate BA has been prepared for the National Marine Fisheries Service (NMFS) to address the potential effects of the project on Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run Chinook salmon (*O. tshawytscha*), Central Valley steelhead (*O. mykiss*), North American green sturgeon (*Acipenser medirostris*), and designated critical habitat for these four species. Therefore, this BA addresses potential effects on VELB, delta smelt, and designated critical habitat for delta smelt only.

Table 2-1. Federally Listed and Proposed Species, and Critical Habitat Potentially Occurring in the Biological Study Area

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Invertebrates					
Vernal pool fairy shrimp	*Branchinecta lynchi*	Threatened—59 FR 19856-19863; September 19, 1994	Found in Central Valley, central and south Coast Ranges from Tehama to Santa Barbara County; isolated populations also in Riverside County; common in vernal pools; also found in sandstone rock outcrop pools.	Absent	No suitable vernal pool habitat is present in the BSA.
Vernal pool tadpole shrimp	*Lepidurus packardi*	Endangered—59 FR 19856; September 19, 1994	Found from Shasta County south to Merced County; occurs in vernal pools and ephemeral stock ponds.	Absent	No suitable vernal pool habitat is present in the BSA.
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	Threatened—45 FR 52803; August 8, 1980	Streamside habitats below 3,000 feet throughout the Central Valley; occurs in riparian and oak savanna habitats with elderberry shrubs; elderberries are the host plant.	Present	Seven elderberry shrubs are present in the BSA. Only one shrub occurs within riparian habitat.
Fish					
Delta smelt	*Hypomesus transpacificus*	Threatened—58 FR 12854–12863; March 5, 1993)	Found primarily in the Sacramento–San Joaquin Estuary but has been found as far upstream as the mouth of the American River on the Sacramento River and Mossdale on the San Joaquin River; range extends downstream to San Pablo Bay; occurs in estuary habitat in the Delta where fresh and brackish water mix in the salinity range of 2–7 parts per thousand (Moyle 2002).	Present, Critical Habitat	The Sacramento River within the BSA provides migration, spawning, and seasonal rearing habitat and is designated as critical habitat for the species (59 FR 65256; December 19, 1994).

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Amphibians					
California tiger salamander	*Ambystoma californiense*	Threatened—69 FR 47212; August 4, 2004	Breeds during the wet season in vernal pools and ponds, with a minimum 10-week inundation period; adults spend most of the year in grassland oak woodland habitat, primarily in small mammal burrows; occurs from Yolo to Kern County in the Central Valley and in the Sierra Nevada foothills from Amador to Tulare County, and from Sonoma to Santa Barbara County on the coast.	Absent	No vernal pools or ponds are present in the BSA, and the BSA is outside the known distribution of the species.
California red-legged frog	*Rana draytonii*	Threatened—61 FR 25813; May 23, 1996	Found along the coast and coastal mountain ranges of California from Mendocino to San Diego County and in the Sierra Nevada from Butte to Tuolumne County; occurs in permanent and semipermanent aquatic habitats, such as creeks and ponds, with emergent and submergent vegetation; uses upland areas for cover (burrows, logs, rocks, and crevices) and dispersal.	Absent	Considered extirpated from the valley floor (U.S. Fish and Wildlife Service 2002).
Reptiles					
Giant garter snake	*Thamnophis gigas*	Threatened—58 FR 5403; October 20, 1993	Sloughs, canals, low-gradient streams, and freshwater marsh habitats with a prey base of small fish and amphibians; also found in irrigation ditches and rice fields; requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter.	Absent	The Sacramento River is not considered suitable aquatic habitat for the species. No other suitable habitat is present in the BSA.
Birds					
Least Bell's vireo	*Vireo bellii pusillus*	Endangered—51 FR 16474; May 2, 1986	Historically nested in riparian habitat throughout the Central Valley, but the majority of the population now occurs in southern California; recently documented nesting on the San Joaquin River west of Modesto; requires dense riparian vegetation for nesting and a dense, stratified canopy for foraging	Absent	The BSA lacks dense riparian vegetation with a stratified canopy.

2.2 Studies Required

It was determined that the following surveys would be required to identify habitat for and assess potential effects on federally listed species in the BSA.

- General habitat evaluation to determine whether suitable habitat exists for federally listed species.
- Elderberry shrub survey according to the USFWS's 1999 *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Guidelines) to document suitable habitat for the federally listed valley elderberry longhorn beetle.
- General stream habitat survey to evaluate the occurrence and extent of shaded riverine aquatic (SRA) cover, including overhead vegetation, undercut banks, and instream woody material that exists for delta smelt in the BSA.

The following sources of information were reviewed prior to field surveys.

- CNDDB records search of the Sacramento West, Clarksburg, Saxon, Rio Linda, Sacramento East, Florin, Taylor Monument, Grays Bend, and Davis USGS 7.5-minute quadrangles (California Department of Fish and Wildlife 2015) (Appendix B).
- USFWS species list obtained from the USFWS website on April 7, 2014.

The *Sacramento-San Joaquin Delta Native Fishes Recovery Plan*, which was completed in 1996 (U.S. Fish and Wildlife Service 1996) was also reviewed during preparation of this BA.

2.3 Personnel and Survey Dates

ICF biologists conducted biological surveys in the BSA in 2014 and 2015 (Table 2-2). Methods and personnel involved in documenting wetlands and other waters of the United States and conducting wildlife and SRA cover habitat surveys are described below. Representative photographs taken during field surveys are provided in Appendix C.

Table 2-2 Biological Survey Personnel and Dates

Survey Type	Survey Date	Surveyors
Natural communities and habitat-based assessment for listed wildlife species	April 14, 2014	John Howe, ICF Wildlife Biologist, 18 yrs. experience Lisa Webber, ICF Botanist/Wetland Ecologist, 25 yrs. experience
Delineation of waters of the United States and waters of the State	April 8, 2015	Lisa Webber
Wildlife habitat assessment and elderberry shrub survey	April 8, 2015	John Howe
Shaded riverine aquatic cover habitat survey and fish passage reconnaissance assessment	May 8 and June 17, 2015	Jeff Kozlowski, ICF Fisheries Biologist, 29 yrs. experience Rita Wilson, ICF Research Assistant, 1 yr. experience

2.3.1 Waters of the United States, Including Wetlands

ICF botanist/wetland ecologist Lisa Webber conducted delineation field work in the BSA on April 8, 2015. The delineation was conducted using the routine onsite determination method described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the supplemental procedures and wetland indicators provided in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (U.S. Army Corps of Engineers 2008). The wetland delineation letter report is included as Appendix A.

2.3.2 Wildlife Resources

ICF biologist John Howe conducted habitat-based field assessments for listed wildlife in the BSA on April 14, 2014, and on April 8, 2015. During the assessments, Mr. Howe took notes on the general topography of the BSA, the vegetation present, and the amount of human activity/disturbance at the site; he recorded wildlife (or wildlife signs) observed during the visit. During the April 8, 2015 site visit, Mr. Howe conducted an elderberry shrub survey according to the USFWS's Guidelines to document the location of elderberry shrubs (the host plant for valley elderberry longhorn beetle) present in the project limits and within 100 feet of the project limits. During the elderberry shrub survey, Mr. Howe recorded information on the number and size of stems, presence or absence of exit holes, and habitat associations. A list of wildlife species observed in the BSA is provided in Chapter 3. The results of the wildlife surveys are presented in Chapters 3 and 4.

2.3.3 Fisheries Resources

On May 8, 2015, ICF fish biologist Jeff Kozlowski, accompanied by Rita Wilson, conducted an SRA cover habitat survey, a fish passage reconnaissance assessment, and a general reconnaissance-level field survey of the Sacramento River within the BSA. The reconnaissance-

level field survey focused on evaluating existing habitat conditions within the BSA relative to the needs of special-status fish species. In addition, Jeff Kozlowski and Rita Wilson took photographs of the banks and levees from the Sacramento River on June 17, 2015. No special-status fish surveys were conducted for the proposed project.

2.4 Agency Coordination and Professional Contacts

The following agency coordination has been conducted for the project.

2.4.1 Caltrans Office of Local Assistance

On June 25, 2014, District 3 Caltrans biologist Maureen Doyle participated in a site visit to the BSA to review and discuss the Preliminary Environmental Study (PES) with project representatives from the Cities of Sacramento and West Sacramento, management and engineering representatives from Mark Thomas and Company, and ICF project management and technical specialist representatives (including John Howe and Lisa Webber).

On June 3, 2015, Caltrans biologist Jennifer Osmondson, ICF biologist John Howe, and ICF botanist/wetland ecologist Lisa Webber participated in a conference call to discuss proposed mitigation for sensitive biological resources.

On June 11, 2015, Ms. Osmondson and Ms. Webber discussed by phone the format of the letter report for the delineation of waters of the United States to be submitted to the U.S. Army Corps of Engineers (USACE).

On October 28, 2015, Ms. Osmondson sent to the NMFS, USFWS, USACE, and CDFW an email invitation for a November 17, 2015 resource agency meeting and site visit with project representatives from the Cities of Sacramento and West Sacramento, management and engineering representatives from Mark Thomas and Company, and ICF project management and technical specialist representatives. The purpose of the meeting was to discuss the design of the project and the potential biological impacts, and to get feedback from the agencies regarding likely mitigation requirements.

On November 17, 2015, Ms. Osmondson and representatives of the Cities of Sacramento and West Sacramento, Caltrans and members of the project consulting team, including Ms. Webber, Mr. Howe, and Mr. Kozlowski, attended the resource agency meeting. A summary of the proposed project and preliminary impact results was provided and input from the agencies regarding the impacts and likely mitigation requirements was solicited.

2.4.2 National Marine Fisheries Service

On June 9, 2015, Jeff Kozlowski, on behalf of Caltrans and the City of Sacramento, and in cooperation with the City of West Sacramento, requested a species list from Maria Rea, Assistant Regional Administrator for NMFS' California Central Valley Area Office for the project. On August 20, 2015, Caltrans obtained a list from NMFS of all proposed and listed endangered and threatened fish species and designated critical habitat that could occur in the vicinity of the project (Rea pers. comm.; Appendix A).

On November 17, 2015, Lieutenant Junior Grade Sean Luis attended the resource agency meeting and offered initial feedback regarding the project and in-water work windows.

2.4.3 U.S. Fish and Wildlife Service

On November 17, 2015, Mr. Armin Halston attended the resource agency meeting and offered initial feedback regarding the project. Mr. Halston was not able to participated for the full duration of the meeting or the site visit. The initial species list was obtained from the USFWS website on April 17, 2015, and was updated on January 27, 2016.

2.4.4 U.S. Army Corps of Engineers

Staff from the USACE was invited to attend the November 17, 2015, resource agency meeting but no representatives attended the meeting.

2.4.5 California Department of Fish and Wildlife

On November 17, 2015, Ms. Tanya Sheya attended the resource agency meeting and offered initial feedback regarding the project and mitigation requirements.

2.4.6 State Lands Commission

There has been no consultation with the State Lands Commission (SLC) to date, but a Land Use Lease will be required for bridge construction in the Sacramento River.

2.5 Limitations That May Influence Results

At the time of the delineation fieldwork, indicators of hydrophytic vegetation, hydric soils, wetland hydrology, and the mean high water line were evident and identifiable. Therefore, there were no limitations with regard to the survey for wetlands and other waters in the BSA.

The assumed presence of, and the impact assessment on, delta smelt depends largely on previously collected data; literature reviews; and general species distribution, habitat requirements, and life history. As stated previously, no fish surveys were conducted; however, it is well documented that delta smelt occur in the Sacramento River in the vicinity of the BSA based on trawl surveys in the Sacramento River (U.S. Fish and Wildlife Service 2015b).

Although designated critical habitat for delta smelt is not present in the BSA, the Sacramento River downstream of the existing I Street Bridge is designated critical habitat for delta smelt, which includes the action area (see section 3.1.1, *Biological Study Area*, for a description of the action area and its relationship to the BSA).

Chapter 3 Results: Environmental Setting

This chapter defines the BSA for the proposed project and describes the existing physical and biological conditions within the BSA.

3.1 Description of the Existing Biological and Physical Conditions

3.1.1 Biological Study Area

The extent of the BSA, which includes all permanent and temporary project impact areas, is shown in Figure 3-1. The BSA consists of the Sacramento River, riparian woodland and open space with bike/pedestrian trails along the Sacramento River, local roads, elevated roads (viaducts) and bridge approach structures, residential areas, and commercial development. The BSA has a relatively high level of historical and ongoing disturbance.

USFWS defines the action area as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action" (50 Code of Federal Regulations [CFR] 402.02). Accordingly, the action area includes the BSA defined above and portions of the Sacramento River that could be affected by elevated turbidity, sediment deposition, and underwater noise generated by in- and near-water construction activities. Because pile driving effects are anticipated to extend beyond water quality effects (with BMPs in place), the action area includes areas both upstream and downstream from pile driving activity where pile driving noise may have a physical or behavioral effect on delta smelt. Based on an analysis of sound expected to be generated by driving 12-inch-diameter steel piles for the temporary trestle without an attenuation device, the 183 decibel (dB) sound exposure level (SEL) accumulated interim criteria (see the pile driving assessment contained in Section 4.3.1.4 for definitions) could be exceeded a distance of up to 1,775 feet (541 meters) upstream and downstream the source. Although noise levels could exceed background levels beyond that point, a distance to any lesser threshold (e.g., 150 dB root mean square, which is sometimes used as a behavioral threshold) cannot be realistically predicted because of the physical geography of the river. The Sacramento River has river channel bends and the straight line distance of open water is 5,400 feet upstream and 5,600 feet downstream of the proposed bridge crossing, and these distances are considerably shorter than the calculated distance (9,600 feet) to which the 150 dB threshold could be exceeded. Consequently, the action area for this project is defined as the entire width of the Sacramento River channel and extending out 2,000 feet beyond the straight-line, open water distances to account for the diffraction and attenuation upstream and downstream of the proposed bridge crossing—that is, 7,400 feet upstream and 7,600 feet

downstream of the proposed bridge crossing (i.e., from approximately RM 58 to approximately RM 61).

3.1.2 Physical Conditions

The BSA is located in the Sacramento Valley subregion of the California Floristic Province (Baldwin et al. 2012:43). The topography in the BSA varies from relatively level to moderate slopes on the Sacramento River levees, and elevations range from approximately -6 to 64 feet above mean sea level.

According to soil data from the Natural Resources Conservation Service, the BSA contains the following five soil map units and water (Natural Resources Conservation Service 2014a).

- Orthents-Urban land complex, 0 to 2 percent slopes (Sacramento County)
- Urban land (Sacramento County)
- Lang sandy loam (Yolo County)
- Lang sandy loam, deep (Yolo County)
- Sycamore silt loam (Yolo County)

The soil profile has been disturbed by development in West Sacramento and construction activity in the Sacramento Railyards area.

Based on the project's Preliminary Geotechnical Report (GEI Consultants 2014), subsurface conditions in the project area are described as follows:

> *The existing borings and cone penetration tests (CPT) performed for levee evaluations on the crest and in the vicinity of the West Sacramento levee (the west end of the planned bridge), encountered approximately 15 feet of loose sand with silt (SP-SM) in the embankment. The sand with silt was underlain by an approximately 9 foot layer of clay (CL), followed by an approximately 16 feet thick layer of sandy silt (ML). The sandy silt was underlain by approximately 35 feet of sand with silt (SP-SM). The apparent densities of the sand with silt ranged from medium dense to very dense. The sand with silt was underlain by approximately 25 feet of very dense gravel (GP), followed by a layer of clay (CL). The maximum depth explored was approximately 115 feet.*
>
> *The existing borings and cone penetration tests on the east end (city of Sacramento) of the planned bridge at the crest of existing levee encountered approximately 6 feet of loose sand with silt (SP-SM). The sand with silt was underlain by approximately 10 feet of loose sand (SP), followed by approximately 7 feet of sandy silt (ML). The sandy silt layer was underlain by approximately 50 feet of sand with silt (SP-SM). The densities of the*

121°30'30"W

121°30'20"W

121°30'10"W

38°35'20"N

B St

3rd St

C St

Jibboom St

Railyards Blvd

Sacramento River

I Street Bridge

5

1

2

3

4

5

6

7

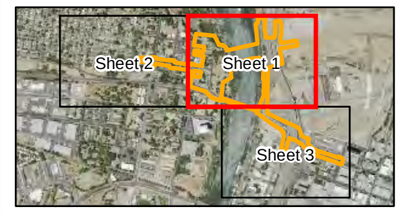
I Street Bridge Replacement Project
Sheet 1

Legend

- Biological Study Area
- Permanent Impacts
- Temporary Impacts
- Staging
- Elderberry Shrubs

Land Cover Types

- Cottonwood Riparian Forest
- Developed/Graded
- Landscaped
- Riparian Forest/Shrub Wetland
- Ruderal Woodland
- Temporary Detention Basin
- Tidal Perennial Stream



N

0 100 200 400
Feet

1 inch = 200 feet

Path: K:\Projects_1\mark_thomas\50203_14_1_St_Bridge\mapdoc\BioFig_3_1_1_LandCover_BA_20160127.mxd Author: . Date: 1/28/2016

Figure 3-1
Impacts on Landcover Types and Sensitive Biological Resources in the Biological Study Area

Figure 3-1
Impacts on Landcover Types and Sensitive Biological Resources in the Biological Study Area

Figure 3-1
Impacts on Landcover Types and Sensitive Biological Resources in the Biological Study Area

sand with silt layer varied from loose to medium dense. The sand with silt layer was underlain by an approximately 23 feet thick layer of medium dense to very dense gravel (GP), followed by a layer of clay (CL). The maximum depth explored was approximately 110 feet.

The substrate in the Sacramento River channel is sand with silt, overlying sand with gravel and gravel (GEI Consultants 2014).

The BSA is within the Lower Sacramento watershed hydrologic unit (hydrologic unit code [HUC] 18020109) (U.S. Environmental Protection Agency 2015). The primary river in the delineation area is the Sacramento River, a traditional navigable water (TNW) that qualifies as another water of the United States (which also is considered a water of the State). The specific characteristics of waters of the United States (including wetlands) in the BSA are further described below in the "Natural Communities" section and in the wetland delineation report (Appendix A).

The climate is generally Mediterranean, with cool, wet winters and hot, dry summers. Precipitation occurs primarily in the winter, generally from November to April, with a distinct dry period from May to October. The average total annual precipitation is approximately 18.20 inches (Western Regional Climate Center 2005).

3.1.3 Biological Conditions in the Biological Study Area

3.1.3.1 Natural Communities

The natural communities in the BSA are interspersed with roadways, railroad tracks, commercial and industrial areas, and residential development. The term *land cover type* is used in this BA to refer to vegetation communities, open water, and unvegetated developed or disturbed areas. Land cover types mapped during field surveys are described below and shown in Figure 3-1. Representative photographs of land cover types within the BSA are provided in Appendix C.

The BSA supports both common vegetation communities and natural communities of special concern. Common vegetation communities are habitats with low species diversity that are widespread, reestablish naturally after disturbance, or support primarily non-native species. These communities generally are not protected by agencies unless the specific site is habitat for or supports special-status species (e.g., raptor foraging or nesting habitat, upland habitat in a wetland watershed). Common vegetation communities in the BSA are ruderal woodland and landscaped areas.

The distribution, representative vegetation, and typical wildlife species found in land cover types within the BSA are described below.

Cottonwood Riparian Forest

Cottonwood riparian forest in the BSA occurs along the upper banks and floodplains of the Sacramento River (Figure 3-1). The overstory of riparian forest is predominantly mature Fremont cottonwood (*Populus fremontii*) trees associated with valley oak (*Quercus lobata*) and black walnut (*Juglans californica* var. *hindsii)*. Other riparian tree species observed include Oregon ash (*Fraxinus latifolia*), boxelder (*Acer negundo* var. *californicum*), and black willow (*Salix gooddingii*). The riparian understory on the waterside of the levee is primarily rip-rap with non-native annual grasses and forbs; however, there are also patches of more typical riparian species, such as narrow-leaf willow (*Salix exigua*), Himalayan blackberry (*Rubus armeniacus*), and mugwort (*Artemisia douglasiana*). The invasive red sesbania (*Sesbania punicea*) shrub was observed in the riparian forest on the Sacramento side of the river. One blue elderberry shrub (*Sambucus nigra* ssp. *caerulea*), was found in riparian habitat on the Sacramento side of the river. One area of riparian forest exhibited positive indicators of all three federal wetland criteria and is discussed below under "Riparian Forest/Shrub Wetland." Riparian forest associated with the Sacramento River in the BSA is depicted in Photos 1 and 2 in Appendix C.

Riparian habitats are sensitive natural communities that provide important habitat for wildlife and SRA cover habitat for fish. Local, state, and federal agencies recognize riparian habitats as sensitive natural communities.

Riparian habitats provide cover, foraging and nesting habitat, and serve as migration and dispersal corridors for several bird and mammal species in the region. Common wildlife species that may occur in these habitats include black phoebe (*Sayornis nigricans*), yellow-rumped warbler (*Dendroica coronata*), house finch (*Carpodacus mexicanus*), American goldfinch (*Carduelis tristis*), yellow-billed magpie (*Pica nuttalli*), pocket gopher (*Thomomys bottae*), fox squirrel (*Sciurus niger*), common muskrat (*Ondatra zibethicus*), and raccoon (*Procyon lotor*).

Riparian Forest/Shrub Wetland

Riparian forest/shrub wetland occurs in the BSA within riparian habitat that meets all three federal wetland criteria (i.e., hydrophytic vegetation, hydric soils, and wetland hydrology). The riparian forest/shrub wetland is located in the northern portion of the BSA, on the west side of the Sacramento River within a low area (Figure 3-1) (Photos 3 and 4 in Appendix C). The vegetative composition of the riparian forest/shrub wetland is predominantly cottonwood but also includes buttonwillow (*Cephalanthus occidentalis* var. *californicus*), boxelder, and narrow-leaf willow. Additional information about the riparian forest/shrub wetland is provided in the wetland delineation report (Appendix A).

As noted above, riparian wetland habitats are sensitive natural communities that provide important cover, foraging, and nesting habitat, and serve as migration and dispersal corridors for several bird and mammal species in the region. Local, state, and federal agencies recognize riparian habitats as sensitive natural communities.

Ruderal Woodland

The West Sacramento section of the BSA includes several areas of naturalized vegetation on undeveloped parcels or parts of parcels that support mature trees with ruderal or non-native annual grassland in the understory. Several parcels between 2nd Street and the levee are predominantly vegetated by the invasive species tree of heaven (*Ailanthus altissima*); several riparian trees are interspersed, including black walnut and Fremont cottonwood. Another invasive tree species, black locust (*Robinia pseudoacacia*), also grows in this area. The understory vegetation in these areas of naturalized vegetation includes non-native annual grasses and forbs, such as wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), foxtail barley (*Hordeum murinum* ssp. *leporinum*), star thistle (*Centaurea solstitialis*), vetch (*Vicia* spp.), and prickly lettuce (*Lactuca serriola*). Several blue elderberry shrubs grow in this community type (Figure 3-1). Representative photographs of ruderal woodland in the BSA are provided as Photos 5, 6, and 7 in Appendix C.

The ruderal woodland and associated ruderal grasslands provide nesting habitat for common birds, including northern mocking bird (*Mimus polyglottos*), western meadowlark (*Sturnella neglecta*), and killdeer (*Charadrius vociferous*) (in more open areas). Mallards from the adjacent river could use the denser areas of ruderal grassland for nesting. This ruderal area also provides foraging habitat for various bird species. Pocket gophers are known to occur in the ruderal woodlands of the BSA.

Perennial Stream (Sacramento River)

The Sacramento River is the only perennial stream in the BSA (see Figure 3-1). All perennial stream is unvegetated open water. The river averages 672 feet wide at the mean high water level in the BSA. The river banks are levees that are mostly steeply sloped and support riparian forest vegetation, as described above, with rip-rap near the bottom of the slope. Additional information about the perennial stream is provided in the wetland delineation report (Appendix A). Representative photographs of the Sacramento River in the BSA are provided as Photos 1 and 2 in Appendix C.

The Sacramento River is a TNW and a water of the United States subject to regulation under CWA Section 404 and Section 10 of the RHA, and is under the jurisdiction of the USACE. The river is considered a sensitive natural community. The RWQCB protects all waters of the State under the Porter-Cologne Act.

Riverine habitats like the Sacramento River provide habitat for amphibians, birds, and mammals. Common wildlife species that could be found in the river and along the shore of the river include American bullfrog (*Lithobates catesbeianus*), mallard (*Anas platyrhynchos*), great egret (*Ardea alba*), and river otter (*Lutra canadensis*). Numerous species of fish also are known to occur in the Sacramento River and are described below.

Landscaped

The vegetation in landscaped areas typically is comprised of ornamental species planted for decorative or landscaping purposes, including oleander (*Nerium oleander*), coast redwood (*Sequoia sempervirens*), California fan palm (*Washingtonia filifera*), Callery pear (*Pyrus calleryana*), Italian cypress (*Cupressus sempervirens*), pines (*Pinus* spp.), non-native oaks (*Quercus* sp.), and fruit trees (Figure 3-1). Landscaping is depicted in Photo 8 in Appendix C.

Common bird species may forage and nest in some of the landscaped areas, including mourning dove, American robin (*Turdus migratorius*), cliff swallow (*Petrochelidon pyrrhonota*) (nests on buildings and bridges), and western scrub jay (*Aphelocoma californica*).

Developed / Graded

Developed portions of the BSA consist of residential structures, commercial/industrial areas, and paved roadways and parking lots. Some small areas mapped as “Developed” on Figure 3-1 include landscaping, where the vegetated patches are small and interspersed with houses and other structures. Graded portions of the BSA include areas adjacent to roadways, the railroad, unpaved parking areas, and the area underneath and east of I-5. The vegetative composition of these areas is generally sparse and generally consists of nonnative species, particularly annual grasses and weedy forbs. Disturbed/ graded areas are depicted in Photos 9 and 10 in Appendix C.

Common wildlife species that would occur in developed areas would be the same as those described above in the landscaped areas.

3.1.3.2 Common Animal Species

Wildlife

The BSA supports common birds and mammals typical of both riverine, riparian, and urban areas. Wildlife species that were observed in the biological study area are western fence lizard (*Sceloporus occidentalis*), great blue heron (*Ardea herodias*), Canada goose (*Branta canadensis*), white-throated swift (*Aeronautes saxatalis*), western scrub jay, northern mockingbird, European starling (*Sturnus vulgaris*), rock dove (*Columbia livia*), yellow-billed magpie, feral house cat (*Felis catus*), black-tailed jackrabbit (*Lepus californicus*), fox squirrel, raccoon (tracks), and skunk (odor) (likely *Mephitis mephitis*).

In addition, several occupied and potential bats roots were observed under the I Street (both sides of the Sacramento River) and Jibboom Street approach structures. During the May 5, 2015 bat surveys, 30 expansion joints were mapped on the approach ramps for a total of 1,132 linear feet of potential bat roosting habitat. Of the 30 expansions joints, 16 were observed to be occupied by bats at the time of the May 15, 2015 survey; they were visually identified as Mexican free-tailed bats (*Tadarida brasiliensis*). Acoustic surveys conducted on the nights of May 5 and June 11, 2015, recorded Mexican free-tailed bats, big brown bats (*Eptesicus fuscus*), Yuma myotis (*Myotis yumanensis*), and western red bat (*Lasiurus blossevillii*)—a California species of special concern.

Wildlife Migration Corridors

The BSA consists of predominantly disturbed and developed areas along both sides of the Sacramento River, with a narrow band of riparian habitat along the river. Despite these existing conditions, the open water portion of the river serves as a migration corridor for aquatic species; and, even though limited, the riparian habitat can be used by birds and other wildlife for dispersing along the Sacramento River corridor. Fish passage and migration within the Sacramento River are discussed below.

Fish

The Sacramento River in the BSA falls within the Sacramento-San Joaquin Province (Central Valley Subprovince), one of six aquatic zoogeographic provinces in California, as defined by Moyle (2002). The Sacramento-San Joaquin Province is drained by the Sacramento and San Joaquin Rivers. Generally, four native fish assemblages can be recognized in Central Valley streams: rainbow trout assemblage, California roach assemblage, pikeminnow-hardhead-sucker assemblage, and deep-bodied fish assemblage (Moyle 2002). Based on its geographic location, the BSA lies at the interface between the zone characterized by the deep-bodied fish assemblage and the Sacramento-San Joaquin Estuary (i.e., the Delta).

Native fish species that occur where the Sacramento River meets the Delta include Sacramento sucker (*Catostomus occidentalis*), Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento splittail (*Pogonichthys macrolepidotus*), Sacramento blackfish (*Orthodon microlepidotus*), hitch (*Lavinia exilicauda*), Chinook salmon (winter-, spring-, fall-, and late fall–run), steelhead, green sturgeon, white sturgeon (*A. transmontanus*), Pacific lamprey (*Entosphenus tridentata*), river lamprey (*Lampetra ayresi*), delta smelt (*Hypomesus transpacificus*), longfin smelt (*Spirinchus thaleichthys*), tule perch (*Hysterocarpus traski*), and prickly sculpin (*Cottus asper*) (Moyle 2002). The dominant fishes, however, are all nonnative (alien) species: largemouth, smallmouth, and spotted bass (*Micropterus* spp.); white and black crappie (*Pomoxis* spp.); bluegill (*Lepomis macrochirus*); American (*Alosa sapidissima*) and threadfin shad (*Dorosoma petenense*); striped

bass (*Morone saxatilis*); bigscale logperch (*Percina macrolepida*); red shiner (*Cyprinella lutrensis*); inland silverside (*Menidia beryllina*); white catfish (*Ameiurus catus*); black and brown bullhead (*Ameiurus* spp.); and common carp (*Cyprinus carpio*) (Moyle 2002).

The Sacramento River is wide and deep and provides unimpeded passage for migratory and resident fish species in the BSA. Although the existing I Street Bridge is supported on three in-water piers, the existing piers do not confine flows or create hydraulic conditions (e.g., shallow water depths or excessive water velocities) that adversely affect the upstream or downstream passage of fish or other aquatic organisms in the Sacramento River.

3.1.3.3 Invasive Species

Invasive plant species include species designated as federal noxious weeds by the USDA, species listed by the California Department of Food and Agriculture (CDFA), and invasive plants identified by Cal-IPC. Invasive plants displace native species, change ecosystem processes, alter plant community structure, and lower wildlife habitat quality (California Invasive Plant Council 2006:1). Road, highway, and related construction projects are some of the principal dispersal pathways for invasive plants and their propagules. FHWA requires that state departments of transportation use the state's noxious weed list to identify invasive plant species that could be spread by construction of transportation projects. Accordingly, Table 3-1 lists the invasive plant species identified by the CDFA and Cal-IPC that are known to occur in the BSA (Natural Resources Conservation Service 2003; California Invasive Plant Council 2006, 2007). No plant species designated as federal noxious weeds have been identified in the BSA (Natural Resources Conservation Service 2014b). Invasive plant species occur in ruderal woodland, disturbed/graded areas, and, to a lesser extent, riparian forest.

Invasive aquatic species occurring in the BSA include many of the non-native fish species listed above, as well as the freshwater clam *Corbicula* (spp.) and several species of aquatic plants (e.g., Brazilian waterweed [*Egeria densa*] and water hyacinth [*Eichhornia crassipes*]).

Table 3-1. Invasive Plant Species Identified in the Biological Study Area

Species	CDFA	Cal-IPC
Tree of heaven (*Ailanthus altissima*)	–	Moderate
Wild oat (*Avena fatua*)	–	Moderate
Black mustard (*Brassica nigra*)	–	Moderate
Ripgut brome (*Bromus diandrus*)	–	Moderate
Soft chess (*Bromus hordeaceus*)	–	Limited
Red brome (*Bromus madritensis* ssp. *rubens*)	–	High
Cheatgrass (*Bromus tectorum*)	–	High
Italian thistle (*Carduus pycnocephalus*)	C	Moderate
Yellow star-thistle (*Centaurea solstitialis*)	C	High
Bindweed (*Convolvulus arvensis*)	C	–
Bermuda grass (*Cynodon dactylon*)	C	Moderate
Red-stemmed filaree (*Erodium cicutarium*)	–	Limited
Rattail fescue (*Festuca myuros*)	–	Moderate
Italian ryegrass (*Festuca perennis*)	–	Moderate
Edible fig (*Ficus carica*)	–	Moderate
Fennel (*Foeniculum vulgare*)	–	High
Cutleaf geranium (*Geranium dissectum*)	–	Limited
English ivy (*Hedera helix*)	–	High
Bristly ox-tongue (*Helminthotheca echioides*)	–	Limited
Foxtail barley (*Hordeum murinum* ssp. *leporinum*)	–	Moderate
Rough cat's-ear (*Hypochaeris radicata*)	–	Moderate
Perennial peppergrass (*Lepidium latifolium*)	B	High
Tree-tobacco (*Nicotiana glauca*)	–	Moderate
Sourgrass (*Oxalis pes-caprae*)	–	Moderate
English plantain (*Plantago lanceolata*)	–	Limited
Rabbitsfoot grass (*Polypogon monspeliensis*)	–	Limited
Wild radish (*Raphanus sativus*)	–	Limited
Black locust (*Robinia pseudoacacia*)	–	Limited
Himalayan blackberry (*Rubus armeniacus*)	–	High
Curly dock (*Rumex crispus*)	–	Limited
Red sesbania (*Sesbania punicea*)	B	High
Milk thistle (*Silybum marianum*)	–	Limited
London rocket (*Sisymbrium irio*)	–	Moderate
Johnson grass (*Sorghum halepense*)	C	–
Smilo grass (*Stipa miliacea*)	–	Limited
Puncturevine (*Tribulus terrestris*)	C	–
Rose clover (*Trifolium hirtum*)	–	Moderate
Periwinkle (*Vinca major*)	–	Moderate

Note: The California Department of Agriculture (CDFA) and California Invasive Plant Council (Cal-IPC) lists assign ratings that reflect the CDFA and Cal-IPC views of the statewide importance of the pest, likelihood that eradication or control efforts would be successful, and present distribution of the pest in the state. These ratings are guidelines that indicate the most appropriate action to take against a pest under general circumstances. The Cal-IPC species list is more inclusive than the CDFA list.

The CDFA categories indicated in the table are defined as follows:

B: Eradication, containment, control or other holding action at the discretion of the county agricultural commissioner.

C: State-endorsed holding action and eradication only when found in a nursery; action to retard spread outside nurseries at the discretion of the county agricultural commissioner.

The Cal-IPC categories indicated in the table are defined as follows:

High: Species with severe ecological impacts, high rates of dispersal and establishment, and usually widely distributed.

Moderate: Species with substantial and apparent ecological impacts, moderate to high rates of dispersal, establishment dependent on disturbance, and limited to widespread distribution.

Limited: Species with minor ecological impacts, low to moderate rates of invasion, limited distribution, and locally persistent and problematic.

Chapter 4 Results: Biological Resources, Discussion of Impacts and Mitigation

This chapter describes the effects of the proposed project on federally listed species under jurisdiction of USFWS. *Direct effects* are defined as the direct or immediate effects of a proposed action on a species or its habitat. Direct effects may result from the action and may include the effects of interrelated and interdependent actions. An *interrelated action* is an activity that is part of the proposed action and depends on the proposed action for its justification. An *interdependent action* is an activity that has no independent utility apart from the action under consultation (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998).

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside the area directly affected by the action (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998).

Cumulative effects comprise the effects of future State, local, and private actions not involving a Federal action that are reasonably certain to occur within the action area under consideration (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998). Potential direct, indirect, and cumulative effects are discussed below.

4.1 Federally Listed or Proposed Plant Species

Based on the USFWS (2016) species list for the project vicinity (Appendix A), no federally listed plants are expected to occur in the BSA.

4.2 Federally Listed or Proposed Wildlife Species

Seven federally listed wildlife species appear on the USFWS species list (see Table 2-1). Based on professional knowledge, reconnaissance level field surveys, one federally listed species, VELB, has the potential to occur in the BSA and be affected by the proposed project. The project would have *no effect* on the remaining six federally listed wildlife species listed in Table 2-1 (vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, California red-legged frog, giant garter snake, and least Bell's vireo) based on the lack of suitable habitat for the species or because the BSA is outside the species' known range. No further evaluation is needed and there is no need for consultation on these species (50 CFR 402.12).

4.2.1 Valley Elderberry Longhorn Beetle

The VELB is federally listed as threatened. The current known range of the VELB extends from Tehama County in the north to Fresno County in the south of California's Central Valley and associated foothills from about the 3,000-foot contour on the east and the watershed of the Central Valley on the west (U.S. Fish and Wildlife Service 1999:1, 79 FR 5874-55917). The VELB is dependent on its host plant, elderberry, which is a common component of riparian corridors and adjacent upland areas in the Central Valley (Barr 1991:5).

The VELB has four stages of life: egg, larva, pupa, and adult. Females deposit eggs on or adjacent to the host elderberry. Egg production varies, and females have been observed to lay between 16 and 180 eggs. Eggs hatch within a few days of being deposited and larvae emerge. The larvae bore into the wood of the host plant and create a long feeding gallery in the pith of the elderberry stem. The larvae feed on the pith of the plant for 1–2 years. When a larva is ready to pupate, it chews an exit hole to the outside of the stem and then plugs it with wood shavings. The larva then retreats into the feeding gallery to an enlarged pupal chamber. The larvae metamorphose into pupae between December and April; the pupal stage is thought to last about a month. The adult remains in the chamber for several weeks after the pupal phase and then emerges from the chamber through the exit hole, which is typically 4–10 millimeters (mm) in diameter and circular to oval in shape. Adults emerge between mid-March and mid-June, the flowering season of the plant. Adults feed on elderberry leaves and mate within the elderberry canopy. (Talley et al. 2006a:7–9).

4.2.1.1 Survey Results

ICF wildlife biologist John Howe surveyed for and mapped elderberry shrubs in the BSA on April 8, 2015. Seven elderberry shrubs were identified within the BSA. Five shrubs are located on the West Sacramento side, and two are on the Sacramento side of the BSA (Figure 3-1). The results of the survey are summarized in Table 4-1. Shrub 1 was observed to be a re-sprout from an elderberry stump, which appeared to have been cut down. The stump was approximately 12 inches in diameter at ground level; multiple new stems were growing out of it and from the surrounding soil. Shrub 5 also was cut down at some point; it had two stumps greater than 5 inches in diameter with new stems growing out of them. Table 4-1 reports only those stems that currently provide habitat for VELB (i.e., the cut stumps themselves are not included). VELB has been documented approximately 0.5 mile north of the BSA along the west bank of the Sacramento River (California Department of Fish and Wildlife 2015).

Table 4-1. Elderberry Shrub Survey Results

Shrub Number	Stem Diameter Class at Ground Level in Inches			Shrub Height in Feet	Exit Holes Present?	Shrub in Riparian Habitat?
	≥1–≤3	>3–<5	≥ 5			
1	4	0	0	6	No	No
2	0	1	1	22	No	No
3	0	0	1	12	No	No
4	4	3	0	15	No	No
5	18	0	0	10	No	No
6	6	0	3	26	No	No
7	0	0	1	20	No	Yes
Total	**32**	**4**	**6**			

4.2.1.2 Critical Habitat

There is no critical habitat for VELB within the BSA.

4.2.1.3 Avoidance and Minimization Efforts

Implementation of the following measures would avoid and/or minimize direct and indirect impacts on VELB.

Measure 1: Install Orange Construction Fencing between the Construction Area and Adjacent Sensitive Biological Resources

The project proponent and/or their contractor will install orange construction fencing between the construction area and adjacent sensitive biological resource areas. Sensitive biological resources that occur adjacent to the construction area that could be directly affected by the project include natural communities of special concern; special-status wildlife habitats for VELB; nest sites of Swainson's hawk (*Buteo swainsoni*), purple martin (*Progne subis*), or other migratory birds; roosting bats; and protected trees to be avoided.

Barrier fencing around sensitive areas will be installed as one of the first orders of work and prior to equipment staging. Before construction begins, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the orange construction fencing, and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as environmentally sensitive areas and clearly identified on the construction plans and described in the specifications. To minimize the potential for snakes and other ground-dwelling animals from being caught in the orange construction fencing, the fencing will be placed with at least a 1-foot gap between the ground and the bottom of the orange construction fencing. The exception to this condition is where construction barrier fencing overlaps with

erosion control fencing and must be secured to prevent sediment runoff. Barrier fencing will be installed before construction activities are initiated, maintained throughout the construction period, and removed after completion of construction.

Measure 2: Conduct Environmental Awareness Training for Construction Employees

The project proponent will retain a qualified biologist to conduct environmental awareness training for construction crews before project implementation. The awareness training will be provided to all construction personnel and will brief them on the need to avoid effects on sensitive biological resources (e.g., native trees, natural communities of special concern, and special-status species habitats in and adjacent to the construction area). The education program will include a brief review of the special-status species with the potential to occur in the BSA (including their life history, habitat requirements, and photographs of the species). The training will identify the portions of the BSA in which the species may occur, as well as their legal status and protection. The program also will cover the restrictions and guidelines that must be followed by all construction personnel to reduce or avoid effects on these species during project implementation. This will include the steps to be taken if a sensitive species is found within the construction area (i.e., notifying the crew foreman, who will call a designated biologist). In addition, construction employees will be educated about the importance of controlling and preventing the spread of invasive plant infestations. An environmental awareness handout that describes and illustrates sensitive resources to be avoided during project construction and identifies all relevant permit conditions will be provided to each crew member. The crew foreman will be responsible for ensuring that crew members adhere to the guidelines and restrictions. Education programs will be conducted for appropriate new personnel as they are brought on the job during the construction period.

Measure 3: Conduct Periodic Biological Monitoring

The project proponent will retain a qualified biological monitor for the project who will visit the site a minimum of once per week to ensure that fencing around environmentally sensitive areas is intact and that activities are being conducted in accordance with the agreed upon project schedule and agency conditions of approval. The monitor will provide the project proponent with a monitoring log for each site visit.

Measure 4: Avoid and Minimize Impacts on Valley Elderberry Longhorn Beetle

The following measures will be implemented prior to and during construction to ensure that the proposed project does not adversely affect elderberry shrubs adjacent to the project footprint.

- Consistent with Measure 2, contractors will be briefed on the need to avoid damaging the elderberry plants and the possible penalties for not complying with these requirements. Crews also will be educated on the status of the VELB and the need to protect its habitat.
- All elderberry shrubs that are outside of the permanent project footprint or that can be avoided will be identified on construction drawings, with notes indicating that they are sensitive resources to be avoided.
- Consistent with Measure 1, orange construction barrier fencing will be placed at a minimum of 20 feet from each shrub's dripline [fencing around shrub 6 (construction will be within 20 feet) will be placed as far out from the dripline as possible]. No construction activities will be permitted within the buffer zone other than those activities necessary to erect the fencing. As specified in the Conservation Guidelines for the Valley Elderberry Longhorn Beetle (Guidelines) (U.S. Fish and Wildlife Service 1999), signs will be posted every 50 feet (at a minimum) along the perimeter of the buffer area fencing. The signs will contain the following information: *This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment*. The signs should be clearly readable from a distance of 20 feet and must be maintained for the duration of construction.
- Consistent with Measure 3, buffer area fences around the shrubs will be inspected weekly by a biological monitor during ground-disturbing activities and monthly after ground-disturbing activities until project construction is complete or until the fences are removed, as approved by the biological monitor. The biological monitor will check that the contractor is maintaining the buffer area fences around elderberry shrubs throughout construction. Biological inspection reports will be provided to USFWS and the project proponent.

Measure 5: Transplant Elderberry Shrubs That Cannot Be Avoided

Elderberry shrubs that cannot be avoided will be transplanted to a USFWS-approved conservation area in accordance with the Guidelines (U.S. Fish and Wildlife Service 1999). Transplanting will occur during the plant's dormant phase (approximately

November through the first 2 weeks of February, after they have lost their leaves). A qualified biologist that is familiar with elderberry shrub transplantation procedures will supervise the transplanting. The location of the conservation area transplantation site will be approved by USFWS before removal of the shrubs.

4.2.1.4 Project Effects

Direct Effects

Five of the seven shrubs (shrubs 1, 2, 3, 5, and 7) would be directly affected (removed or trimmed) by project construction. Shrubs 1, 2, 3, and 7 are within areas identified as temporarily impacted by project construction. Although these shrubs could be avoided, construction activities would likely be within 20 feet of the shrub driplines. Shrub 5 would be permanently impacted by a new access road.

Indirect Effects

Two elderberry shrubs (shrubs 4 and 6) could be indirectly affected by project construction (i.e., impacts between 20 and 100 feet from the shrub dripline). Shrub 4 is approximately 80 feet west of areas identified for temporary disturbance associated with the removal of the West Sacramento approach structure; shrub 6 is located immediately adjacent to the area identified as temporarily affected and less than 20 feet from areas of permanent impact. The USFWS typically considers project activities that result in a change in hydrology, fragmentation of habitat, drift of fertilizers or pesticides, increased pedestrian traffic, artificial lighting, and dust as potential indirect effects on the species. The project would not result in any of these effects on shrubs 4 and 6. Both shrubs are located in developed areas that are already subject to pedestrian traffic, artificial lighting, and the potential use of herbicides and pesticides from adjacent developed areas. The project construction that would occur within 100 feet of shrub 4 is limited to the removal of the approach structure on the West Sacramento side of the river, which would not result in an alternation of the hydrology in this area. Although work would occur within 20 feet of shrub 6, it is located on the embankment of I-5, which is above the current grade. Thus, construction activities at Bercut Drive and Railyards Boulevard are not likely to substantially alter the hydrology in the area around the shrub such that it would be adversely affected. Talley et al. (2006b:647) found that elderberry shrubs adjacent to paved surfaces were less stressed that those near dirt surfaces, possibly because increased runoff from paved surfaces benefitted the shrubs. Talley et al. also found that dust from low-traffic dirt roads trails and paved roads did not affect VELB presence in shrubs either directly or indirectly through changed elderberry condition (Talley et al. 2006b:647). Therefore, project dust is not expected to affect the VELB or its habitat associated with shrubs 4 and 6. Though shrubs 4 and 6 are located within 100 feet of project construction, construction activities and the operation of the project are not expected to result in a change in condition that could result in take of VELB.

Project construction is *likely to adversely affect* the federally threatened VELB through the loss of suitable habitat in accordance with the definition of take under the ESA.

4.2.1.5 Modifications to the Project to Mitigate Effects

Implementation of Measure 6 would compensate for direct impacts on VELB habitat.

Measure 6: Compensate for Impacts on Valley Elderberry Longhorn Beetle Habitat

Before construction begins, the project proponent will compensate for direct impacts (including transplanting) on all elderberry stems measuring 1 inch or more at ground level (i.e., habitat for VELB) that are located within 20 feet of proposed construction activities. Compensation will include planting replacement elderberry seedlings or cuttings and associated native plantings in a USFWS-approved conservation area, at a ratio between 1:1 and 8:1 (ratio = new plantings to affected stems), depending on the diameter of the stem at ground level, the presence or absence of exit holes, and whether the shrub is located in riparian habitat (U.S. Fish and Wildlife Service 1999).

Mitigation credits for VELB will be purchased at a USFWS-approved mitigation bank. There are three mitigation banks listed on the USFWS website that sell VELB credits and have service areas that overlap the BSA. These banks are: French Camp Conservation Bank, Laguna Creek Conservation Bank, and River Ranch Conservation Bank.

Table 4-2 summarizes the compensation required for direct effects on five elderberry shrubs (shrubs 1, 2, 3, 5, and 7) that provide VELB habitat. Based on stem counts listed in Table 4-1 for these five shrubs and in accordance with the Guidelines, 34 elderberry seedlings and 34 associated native plants will be planted in a USFWS-approved conservation area.

Table 4-2. Required Compensation for Directly Affected Elderberry Shrubs

Habitat	Stem Diameter	Number of Stems	Exit Holes?	Seedling Ratio	Native Plant Ratio	Total Seedling	Total Native Plants
Riparian	Stems >1" to <3"	0	No	2:1	1:1	0	0
	Stems >1" to <3"	0	Yes	4:1	2:1	0	0
	Stems >3" to <5"	0	No	3:1	1:1	0	0
	Stems >3" to <5"	0	Yes	6:1	2:1	0	0
	Stems >5"	1	No	4:1	1:1	4	4
	Stems >5"	0	Yes	8:1	2:1	0	0
Nonriparian	Stems >1" to <3"	22	No	1:1	1:1	22	22
	Stems >1" to <3"	0	Yes	2:1	2:1	0	0
	Stems >3" to <5"	1	No	2:1	1:1	2	2
	Stems >3" to <5"	0	Yes	4:1	2:1	0	0
	Stems >5"	2	No	3:1	1:1	6	6
	Stems >5"	0	Yes	6:1	2:1	0	0
Total		**26**				**34**	**34**

4.2.1.6 Cumulative Effects

Under the ESA, cumulative effects are "those effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area of the federal action subject to consultation" (50 CFR 402.2). Future federal actions that are unrelated to the proposed action are not considered in this assessment because they require separate consultation pursuant to Section 7 of the ESA.

Caltrans is not aware of any future state or private activities that are reasonably certain to affect VELB within the area potentially affected by the proposed project.

4.3 Federally Listed or Proposed Fish Species

Federally listed fish species that could occur in the action area, including the Sacramento River portion of the BSA, were identified based on a review of existing information and the USFWS (2015a; 2016) species list for the project vicinity (Appendix A). One federally listed fish species under USFWS jurisdiction, delta smelt, has the potential to occur in the action area and be affected by the proposed project (Table 2-1). As discussed in Chapter 2, four other federally listed fish species (Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, and North American green sturgeon) occur in the action area; however, because these species fall under the jurisdiction of NMFS, project impacts on these species are being evaluated in a separate BA.

4.3.1 Delta Smelt

Status and Distribution

Delta smelt was federally listed as threatened on March 5, 1993 (58 FR 12854–12863), and critical habitat was designated on December 19, 1994 (59 FR 65256–65278). In response to several lawsuits, USFWS conducted a 5-year status review for delta smelt. USFWS concluded on March 31, 2004, that delta smelt abundance remained relatively low compared to historical levels and that many of the threats to the species identified at the time of listing were still in existence, precluding de-listing of the species (U.S. Fish and Wildlife Service 2004). Subsequent indices of delta smelt abundance based on results of CDFW fishery sampling have shown that the abundance of delta smelt continued to decline to record low numbers.

In March 2006, several environmental groups filed an emergency petition with USFWS, requesting that the status of delta smelt be elevated from threatened to endangered under ESA (Center for Biological Diversity et al. 2006). The emergency petition was not approved by USFWS; however, on July 10, 2008, USFWS announced in a 90-day finding that consideration for reclassification of delta smelt was warranted and that a status review would be initiated (73 FR 39639). On April 7, 2010, USFWS ruled that the change in the status of delta smelt from threatened to endangered was warranted but was precluded by other higher priority listing actions (75 FR 17667).

Delta smelt was listed as a threatened species under CESA on December 9, 1993. In February 2007, an emergency petition was filed with the California Fish and Game Commission to elevate the status of delta smelt from threatened to endangered under CESA (The Bay Institute et al. 2007). On March 4, 2009, the California Fish and Game Commission elevated the status of delta smelt to endangered under CESA.

Historically, delta smelt populations have fluctuated greatly in response to their 1-year life cycle and ever-changing environmental conditions. In the last 30 years, delta smelt populations have shown a long-term decline in the upper estuary (the Delta and Suisun Bay), beginning with an abrupt decline in 1982 (Kimmerer 2002) and extremely low abundance in recent years as part of the pelagic organism decline (POD) (Sommer et al. 2007; Baxter et al. 2010). The low abundance of delta smelt since the early 1980s is attributed to a number of interacting factors. The principal factors contributing to the decline in delta smelt abundance include reductions in outflows and entrainment losses to water diversions, especially by the SWP and CVP pumping facilities located in the south Delta; extremely high river outflows that flush delta smelt and zooplankton out of the system; changes in prey abundance and composition caused by introduced species; predation by non-native species; toxic substances, including agricultural

pesticides, heavy metals, and other compounds; disease; and loss of genetic integrity through interbreeding with the introduced Wagasaki smelt (Moyle 2002; Bennett 2005).

The geographic distribution of delta smelt occurs primarily downstream of Isleton on the Sacramento River, in the Cache Slough subregion (Cache Slough–Liberty Island and the Deep Water Ship Channel [DWSC]), downstream of Mossdale on the San Joaquin River, and Suisun Bay and Suisun Marsh (Moyle 2002). Delta smelt also have been collected in the Petaluma and Napa Rivers (Bennett 2005); the Sacramento River above Rio Vista; and Cache, Lindsey, Georgiana, Prospect, Beaver, Hog, Sycamore, and Barker Sloughs (U.S. Fish and Wildlife Service 1996). Delta smelt have been observed in the Sacramento River as far upstream as the mouth of the Feather River and in the DWSC as far upstream as West Sacramento (Merz et al. 2011). Over the last 2 decades, the center of adult delta smelt abundance in fall (September through December) has been the West Delta and Suisun Bay subregions (Sommer et al. 2011). There is evidence that a life-history contingent of delta smelt may remain in the Cache Slough subregion throughout their lives (Nobriga et al. 2008; Sommer et al. 2011).

Life History

Delta smelt are endemic to the Sacramento–San Joaquin estuary and are found seasonally in Suisun Bay and Suisun Marsh (Moyle 2002). They typically are found in shallow water (<10 feet) where salinity ranges from 2 to 7 parts per thousand (ppt), although they have been observed at salinities between 0 and 18.4 ppt (Moyle 2002). Delta smelt have relatively low fecundity and most live for 1 year (Moyle 2002). They feed on planktonic copepods, cladocerans, amphipods, and insect larva (Moyle 2002).

Delta smelt are semi-anadromous. During their spawning migration, adults move into the freshwater channels and sloughs of the Delta between December and January (Moyle 2002). Spawning occurs between January and July, with peak spawning from April through mid-May (Moyle 2002). Spawning locations in the Delta have not been identified and are inferred from larval catches (Bennett 2005). Larval fish have been observed in Montezuma Slough (Wang 1986); Suisun Slough in Suisun Marsh (Moyle 2002); the Napa River estuary (Stillwater Sciences 2006); the Sacramento River above Rio Vista; and Cache, Lindsey, Georgiana, Prospect, Beaver, Hog, Sycamore, and Barker Sloughs (U.S. Fish and Wildlife Service 1996). Spawning also was detected in the Sacramento River up to Garcia Bend (RM 51) during drought conditions as a result of increased saltwater intrusion that moved delta smelt spawning and rearing farther inland (Wang and Brown 1993). Laboratory experiments have found eggs to be adhesive, demersal, and usually attached to substrate composed of gravel, sand, or other submerged material (Moyle 2002; Wang 1991). Hatching takes approximately 9 to 13 days, and larvae begin feeding 4 to 5 days later (Moyle 2002). Newly hatched larvae contain a large oil

globule that makes them semi-buoyant and allows them to stay near the bottom (Moyle 2002). As their fins and swim bladder develop, they move higher into the water column and are transported downstream to the open waters of the estuary (Moyle 2002).

Factors Affecting Abundance

Diversions and Delta inflow and outflow may affect survival of delta smelt. Estimates of delta smelt entrainment at the CVP and SWP South Delta export facilities suggest a population decline in the early 1980s, mirroring the decline indicated by mid-water trawl, summer tow-net, Kodiak trawl, and beach seine data (Bennett 2005). Diversions and upstream storage, including operation of the CVP and SWP, control Delta inflow and outflow during most months. Reduced Delta flow may inhibit or slow movement of larvae and juveniles to estuarine rearing habitat, increasing their residence in the deeper and narrower channels of the Delta and exposure to lower prey availability and increased predation (Moyle 2002). Reduced Delta flow also may increase entrainment in diversions, including entrainment at the CVP and SWP export pumps (Moyle 2002). Additional factors affecting delta smelt abundance include extremely high river outflow that increases entrainment at export facilities, changes in prey abundance and composition, predation by non-native species, toxic substances, disease, and loss of genetic integrity through interbreeding with the introduced Wagasaki smelt (Moyle 2002; Bennett 2005).

4.3.1.1 Survey Results

Focused surveys for delta smelt were not conducted. However, it is well documented that delta smelt occur in the Sacramento River in the action area. Spawning locations in the Delta have not been identified and are inferred from the location of gravid females and larval catches (Bennett 2005).

The temporal occurrence and relative abundance of adult delta smelt in the vicinity of the action area can be inferred based on the weekly trawl surveys of the Sacramento River at Sherwood Harbor (RM 55) as part of the Delta Juvenile Fish Monitoring Program (DJFMP) (U.S. Fish and Wildlife Service 2015b). In addition to collecting data on the relative number and timing of occurrence of delta smelt, USFWS collects information on the maturation status of adult smelt (i.e., individuals are physically examined at the time of capture to determine their readiness to spawn based on whether eggs or milt can be manually expressed from the individual). Maturation status provides information on the potential timing of spawning and, therefore, the potential occurrence of the species' eggs and larvae in the river. The occurrence of mature adults in the trawl samples suggests that delta smelt may spawn in this part of the Sacramento River, including action area.

From January 2005 through March 2015, adult delta smelt (some in spawning condition) were detected in the trawls from February through May, although most were detected in the trawls in

March (Table 4-3). Because of the proximity of the action area to Sherwood Harbor, it was assumed that the timing of occurrence of delta smelt in the action area is similar to that observed at Sherwood Harbor.

Table 4-3. Number of Delta Smelt Captured by Trawl at Sherwood Harbor (RM 55) by Month (January 2005 through March 2015)

Month/ Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Monthly Total[a]
Jan												0
Feb	1											1
Mar	3			1		1		28		18		51
Apr	2			1				1	1	3		8
May		1										1
Jun												0
Jul												0
Aug												0
Sep												0
Oct												0
Nov												0
Dec												0
Annual Total	**6**	**1**	**0**	**2**	**0**	**1**	**0**	**29**	**1**	**21**	**NA**	**61**

[a] 2015 data excluded from totals.
NA = Not applicable

4.3.1.2 Critical Habitat

Critical habitat includes those physical and biological features of the habitat that are essential to the conservation of the species and that may require special management consideration or protection. Critical habitat for delta smelt consists of all water and all submerged lands below OHWM and the entire water column bounded by and contained in Suisun Bay (including the contiguous Grizzly and Honker bays); the length of Goodyear, Suisun, Cutoff, First Mallard (Spring Branch), and Montezuma Sloughs; and the contiguous waters of the legal Delta (59 FR 65256; December 19, 1994). Therefore, the Sacramento River upstream of the existing I Street Bridge (upstream boundary of the legal Delta) is not designated as critical habitat for delta smelt as it does not lie within the boundaries of the legal Delta (59 FR 65256; December 19, 1994). Consequently, only that portion of the action area (defined in Chapter 3) that occurs downstream of the existing I Street Bridge is designated as critical habitat for delta smelt. Primary constituent elements of critical habitat determined to be essential to the conservation of delta smelt are physical habitat, water, river flow, and salinity concentrations required to maintain delta smelt habitat for spawning, larval and juvenile transport, rearing, and adult migration (U.S. Fish and Wildlife Service 2006).

4.3.1.3 Avoidance and Minimization Efforts

Implementation of the following measures would avoid and/or minimize direct and indirect effects on delta smelt and designated critical habitat.

Measure 1: Install Orange Construction Fencing between the Construction Area and Adjacent Sensitive Biological Resources

Please refer to the discussion of Measure 1 in Section 4.2.1.3.

Measure 2: Conduct Environmental Awareness Training for Construction Employees

Please refer to the discussion of Measure 2 in Section 4.2.1.3.

Measure 3: Conduct Periodic Biological Monitoring

Please refer to the discussion of Measure 3 in Section 4.2.1.3.

Measure 7: Conduct All In-Water Construction Activities between May 1 and November 30 and during Daylight Hours Only

The project proponents will conduct all in-water construction work and pile driving (in-water and shore-based within 250 feet of the Sacramento River), installation of cofferdams, removal of temporary sheet piles, and placement of rock revetment between May 1 and November 30 to avoid or minimize causing disturbance and injury to, or mortality of, special-status fish species in the affected reaches of the Sacramento River. In addition, in-water work will be conducted during daylight hours only to provide fish in the affected reaches of the Sacramento River with an extended quiet period during nighttime hours for feeding and unobstructed passage.

Limiting in-water construction to the May 1–November 30 period would achieve the following two goals.

In-water construction activities with the potential to generate harmful levels of underwater noise (e.g., driving piles with an impact hammer) would avoid the primary migration periods of adults and juveniles of special-status fish species.

The length of the in-water construction period would be maximized, thereby limiting the number of construction seasons that in-water construction would be needed and the number of year classes of fish species that potentially would be exposed to in-water construction effects.

Measure 8: Implement Measures to Minimize Exceedance of Interim Threshold Sound Levels during Pile Driving

The project proponents will require the contractor to implement the following measures, developed in coordination with project design engineers, to minimize the exposure of listed fish species to potentially harmful underwater sounds.

The contractor will vibrate all piles to the maximum depth possible before using an impact hammer.

No more than 20 piles will be driven per day, and pile driving with an impact hammer will occur on no more than 75 individual days total during construction.

During impact driving, the contractor will limit the number of strikes per day to the minimum necessary to complete the work and will limit the total number of hammer strikes to 16,000 strikes per day (i.e., 800 hammer strikes per pile, per day) for piles for the bridge piers and temporary trestles, and 20,000 strikes per day (i.e., 1,000 hammer strikes per pile, per day) for the piles for the bridge fender system.

The smallest pile driver and minimum force necessary will be used to complete the work.

During impact driving, the project proponents will require the contractor to use a bubble curtain or similar device to minimize the extent to which the interim peak and cumulative SEL thresholds are exceeded (see Section 4.4.1.3, “Project Impacts”).

No pile driving activity will occur at night, thereby providing fish with an extended quiet period during nighttime hours on days pile driving is being conducted for feeding and unobstructed passage.

Measure 9: Develop and Implement a Hydroacoustic Monitoring Plan

The project proponents and/or their construction contractor will develop and implement a hydroacoustic monitoring plan. The monitoring plan will be submitted to the resource agencies (CDFW, NMFS, and USFWS) for approval at least 60 days before the start of project activities. The plan will include the following requirements.

The project proponent and/or its construction contractor will monitor underwater noise levels during all impact pile driving activities on land and in water to ensure that peak and cumulative SELs do not exceed estimated values (Table 4-7).

The monitoring plan will describe the methods and equipment that will be used to document the extent of underwater sounds produced by pile driving, including the number, location, distances, and depths of the hydrophones and associated monitoring equipment.

The monitoring plan will include a reporting schedule for daily summaries of the hydroacoustic monitoring results and for more comprehensive reports to be provided to the resource agencies on a monthly basis during the pile driving season.

The daily reports will include the number of piles installed per day; the number of strikes per pile; the interval between strikes; the peak SPL, SEL, and RMS per strike; and the accumulated SEL per day at each monitoring station.

The project proponent or its contractors will ensure that a qualified fish biologist is on site during impact pile driving to document any occurrences of stressed, injured, or dead fish. If stressed, injured, or dead fish are observed during pile driving, the project proponent and/or its construction contractor will reduce the number of strikes per day to ensure that fish are no longer showing signs of stress, injury, or mortality.

Measure 10: Protect Water Quality and Prevent Erosion and Sedimentation in Drainages and Wetlands

The project proponents and/or their construction contractor will comply with all construction site BMPs specified in the Water Quality Assessment Report prepared for the project (ICF 2015) and the final SWPPP that will be developed for the project, as well as any other permit conditions to minimize introduction of construction-related contaminants and mobilization of sediment in the Sacramento River and the riparian forest/shrub wetland. Broadly, these BMPs will address soil stabilization, sediment control, wind erosion control, vehicle tracking control, non-storm water management, and waste management practices. The BMPs will be based on the best conventional and best available technology.

The proposed project is subject to storm water quality regulations established under the NPDES, described in Section 402 of the federal CWA. In California, the NPDES program requires that any construction activity disturbing 1 or more acres comply with the statewide General Permit, as authorized by the State Water Board. The General Permit requires elimination or minimization of non-storm water discharges from construction sites and development and implementation of a SWPPP for the site. The primary elements of the SWPPP include the following.

- Description of site characteristics—including runoff and streamflow characteristics and soil erosion hazard—and construction procedures
- Guidelines for proper application of erosion and sediment control BMPs
- Description of measures to prevent and control toxic materials spills
- Description of construction site housekeeping practices

In addition to these primary elements, the SWPPP specifies that the extent of soil and vegetative disturbance would be minimized by control fencing or other means and that the extent of soil disturbed at any given time would be minimized. The SWPPP must be retained at the construction site.

The BMPs will be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable; they are subject to review and approval by the project proponent. The project proponent will perform routine inspections of the construction area to verify that the BMPs are properly implemented and maintained. The project proponent will notify contractors immediately of a noncompliance issue and will require compliance.

The BMPs will include, but are not limited to, the following.

- All earthwork or foundation activities involving wetlands or the intermittent vegetated stream will occur in the dry season (between May 1 and October 31). All in-water work within the Sacramento River will be conducted between May 1 and November 30 to minimize or avoid potential impacts on sensitive life stages (migration, spawning, egg and embryo incubation, and rearing) of special-status fish species.
- Equipment used in and around drainages and wetlands will be in good working order and free of dripping or leaking engine fluids. All vehicle maintenance will be performed at least 300 feet from all streams. Any necessary equipment washing will be carried out where the water cannot flow into drainages or wetlands.
- Develop a hazardous material spill prevention control and countermeasure plan before construction begins. The plan will include strict onsite handling rules to keep construction and maintenance materials from entering the river, including procedures related to refueling, operating, storing, and staging construction equipment and to preventing and responding to spills. The plan also will identify the parties responsible for monitoring a spill response. During construction, any spills will be cleaned up immediately according to the spill prevention control and countermeasure plan. The project proponent will review and approve the contractors' spill prevention control and countermeasure plan before allowing construction to begin.
- Prohibit the following types of materials from being rinsed or washed into the streets, shoulder areas, or gutters: concrete, solvents and adhesives, thinners, paints, fuels, sawdust, dirt, gasoline, asphalt and concrete saw slurry, and heavily chlorinated water.
- Take any surplus concrete rubble, asphalt, or other rubble from construction to a local landfill.
- Prepare and implement an erosion and sediment control plan for the proposed project that will include the following provisions and protocols. The SWPPP for

the project will detail the applications and type of measures and the allowable exposure of unprotected soils.

- Discharge from dewatering operations, if needed, and runoff from disturbed areas will be made to conform to the water quality requirements of the waste discharge permit issued by the RWQCB.
- Apply temporary erosion control measures, such as sandbagged silt fences, throughout construction of the proposed project and remove them after the working area is stabilized or as directed by the engineer. Soil exposure will be minimized through use of temporary BMPs, groundcover, and stabilization measures. Exposed dust-producing surfaces will be sprinkled daily, if necessary, until wet; this measure will be controlled to avoid producing runoff. Paved roads will be swept daily following construction activities.
- The contractor will conduct periodic maintenance of erosion and sediment control measures.
- Plant an appropriate seed mix of native species on disturbed areas upon completion of construction.
- Cover or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more) that could contribute sediment to waterways.
- Enclose and cover exposed stockpiles of dirt or other loose, granular construction materials that could contribute sediment to waterways. Material stockpiles will be located in non-traffic areas only. Side slopes will not be steeper than 2:1. All stockpile areas will be surrounded by a filter fabric fence and interceptor dike.
- Contain soil and filter runoff from disturbed areas by berms, vegetated filters, silt fencing, straw wattle, plastic sheeting, catch basins, or other means necessary to prevent the escape of sediment from the disturbed area.
- Use other temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) to control erosion from disturbed areas as necessary.
- Avoid earth or organic material from being deposited or placed where it may be directly carried into the channel.

The project proponents also will obtain a 401 Water Quality Certification from the Central Valley RWQCB, which may contain additional BMPs and water quality measures to ensure the protection of water quality.

Measure 11: Monitor Turbidity in the Sacramento River

The project proponents will require the construction contractor to monitor turbidity levels in the Sacramento River during in-water construction activities (e.g., pile driving, extraction of temporary sheet piles used for cofferdams, placement of RSP). Turbidity will be measured using standard techniques upstream and downstream of the construction area to determine whether changes in ambient turbidity levels exceed 20%, the threshold derived from the Sacramento and San Joaquin Rivers Basins Plan (Central Valley Regional Water Quality Control Board 2011). If it is determined that turbidity levels exceed the 20% threshold, then the project proponent and/or its contractors will adjust work to ensure that turbidity levels do not exceed the 20% threshold.

Measure 12: Implement Cofferdam Restrictions

The following restrictions will be implemented during installation of the cofferdams and cofferdam dewatering.

The extent of cofferdam footprints will be limited to the minimum necessary to support construction activities.

Sheet piles used for cofferdams will be installed and removed using a vibratory pile driver.

Cofferdams will be installed and removed only during the proposed in-water work window (between May 1 and November 30).

Cofferdams will not be left in place over winter where they could be overtopped by winter/spring flows and when juveniles of listed species are most likely to be present in the construction area.

All pumps used during dewatering of cofferdams will be screened according to CDFW and NMFS guidelines for screens.

Cofferdam dewatering and fish rescue/relocation from within cofferdams will commence immediately following cofferdam closure.

Measure 13: Prepare and Implement a Fish Rescue and Relocation Plan

The project proponents and/or their construction contractor will develop and implement a fish rescue and relocation plan to recover any fish trapped in cofferdams. The fish rescue and relocation plan will be submitted to the resource agencies (CDFW, NMFS, and USFWS) for approval at least 60 days before initiating activities to install cofferdams. At a minimum, the plan will include the following.

A requirement that fish rescue and relocation activities will commence immediately after cofferdam closure and that dewatering has sufficiently lowered water levels inside cofferdams to make it feasible to rescue fish.

A description of the methods and equipment proposed to collect, transfer, and release all fish trapped within cofferdams. Capture methods may include seining, dip netting, and/or electrofishing as approved by CDFW, NMFS, and USFWS. The precise methods and equipment to be used will be developed cooperatively by CDFW, NMFS, USFWS, and the project proponent and/or contractor.

A requirement that only CDFW-, NMFS-, and USFWS-approved fish biologists will conduct the fish rescue and relocation.

A requirement that fish biologists will contact CDFW, NMFS, and USFWS immediately if any listed species are found dead or injured.

A requirement that a fish rescue and relocation report be prepared and submitted to CDFW, NMFS, and USFWS within 5 business days following completion of the fish relocation. Data will be provided in tabular form and at a minimum will include the species and number rescued and relocated, approximate size of each fish (or alternatively, approximate size range if large number of individuals are encountered), date and time of their capture, and general condition of all live fish (e.g., good–active with no injuries; fair–reduced activity with some superficial injuries; poor–difficulty swimming/orienting with major injuries). For dead fish, additional data will include fork length and description of injuries and/or possible cause of mortality if it can be determined.

Measure 14: Prevent the Spread or Introduction of Aquatic Invasive Species

The project proponents or their contractor will implement the following actions to prevent the potential spread or introduction of AIS associated with the operation of barges and other in-water construction activities. Species of concern related to the operation of barges and other equipment in the lower Sacramento River include invasive mussels (e.g., quagga mussels [*Dreissena bugensis*] and zebra mussels [*Dreissena polymorpha*]) and aquatic plants (e.g., Brazilian waterweed [*Egeria densa*] and hydrilla [*Hydrilla verticillata*]) (California Department of Fish and Game 2008).

The project proponents or their contractors will coordinate with the CDFW's Invasive Species Program to ensure that the appropriate BMPs are implemented to prevent the spread or introduction of AIS.

Educate construction supervisors and managers about the importance of controlling and preventing the spread of AIS.

Train vessel and equipment operators and maintenance personnel in the recognition and proper prevention, treatment, and disposal of AIS.

To the extent feasible, prior to departure of vessels from their place of origin and before in-water construction equipment is allowed to operate within the waters of the Sacramento River, thoroughly inspect and remove and dispose of all dirt, mud, plant matter, and animals from all surfaces that are submerged or may become submerged, or places where water can be held and transferred to the surrounding water.

Measure 15: Minimize or Avoid Temporary Construction Lighting and Permanent Bridge Lighting from Directly Radiating on Water Surfaces of the Sacramento River

The project proponents will minimize or avoid the effects of nighttime lighting on special-status fish species by implementing the following actions.

Temporary Construction Lighting

- Avoiding construction activities at night, to the maximum extent practicable.
- Using the minimal amount of lighting necessary to safely and effectively illuminate the work areas.
- Shielding and focusing lights on work areas and away from the water surface of the Sacramento River, to the maximum extent practicable.

Permanent Bridge Lighting

- Minimizing nighttime lighting of the bridge structure for aesthetic purposes.
- Using the minimal amount of lighting necessary to safely and effectively illuminate vehicular, bicycle, and pedestrian areas on the bridge.
- Shielding and focusing lights on vehicular, bicycle, and pedestrian areas and away from the water surface of the Sacramento River, to the maximum extent practicable.

4.3.1.4 Project Impacts

The following assessment addresses potential direct and indirect effects of the proposed project on delta smelt and designated critical habitat (where applicable). Potential project effects on delta smelt and critical habitat include both short-term and long-term effects. Short-term effects include temporary construction-related impacts on fish and aquatic habitat that may last from a few hours to days (e.g., suspended sediment and turbidity, construction noise, artificial lighting). Long-term effects (addition of overwater structure, loss of aquatic habitat [substrate and water column], loss of SRA cover habitat) typically would last months or years, or would be permanent. These effects are generally due to physical alteration of important habitat attributes of the channel, shoreline, and adjacent bank. Short-term effects on delta smelt were evaluated qualitatively based on general knowledge of the impact mechanisms and the anticipated responses by delta smelt to construction actions. Long-term effects were measured in terms of

the area and/or linear feet of artificial shade created by the new bridge, and the area and/or linear feet of aquatic habitat and SRA cover habitat affected by the proposed project.

Direct Effects

Pile Driving Noise

Impact pile driving is of particular concern because of the intensity of sounds and known occurrences of fish kills associated with impact pile driving (Popper and Hastings 2009). The effects of pile driving noise on fish may include behavioral responses, physiological stress, temporary and permanent hearing loss, tissue damage (auditory and non-auditory), and direct mortality (Popper and Hastings 2009). In general, factors that may influence the magnitude of effects include species, life stage, and size of fish; type and size of pile and hammer; frequency and duration of pile driving; site characteristics (e.g., water depth); and distance of fish from the source of the underwater sound.

The primary source of underwater noise associated with the project would be driving the 200 16-inch piles with an impact hammer for the two in-water piers (i.e., piers 2 and 5) and two in-levee abutments (i.e., abutments 1 and 6) for the new bridge, the 160 16-inch piles for the temporary trestle and work platforms, the 60 16-inch piles for the bridge fender system, and the eight 16-inch spud piles for the barges (Figure 1-3). Additional sources of underwater noise associated with the project would occur during installation of the eight 108-inch steel casings for the two in-water piers (i.e., piers 3 and 4) for the lift span with a vibratory hammer and/or hydraulic-driven oscillator/rotator system, and installation and removal of temporary sheet piles with a vibratory hammer for the temporary cofferdams used to isolate the in-water construction areas for bridge piers 2 and 5. Only driving of piles with an impact hammer is expected to produce sound levels that could result in injury to fish.

Table 4-4 presents a summary of the pile driving assumptions used in the analysis, including assumptions related to pile location (e.g., structure location, land, in-water, in de-watered cofferdam), pile size and type (e.g., steel pipe, steel H pile, concrete), the number of piles to be installed (e.g., total and number per day), type of driver to be used (e.g., impact, vibratory, hydraulic driven oscillator/rotator system), estimated total pile strikes (e.g., per pile and day), sound attenuation (e.g., bubble curtain, dewatered cofferdam, none), and underwater sound level assumptions. Because a specific pile type has not been determined, Table 4-4 presents pile driving assumptions for all possible pile driving scenarios, including with and without sound attenuation (i.e., bubble curtain).

The assessment of underwater noise impacts on delta smelt is based on the overlap of construction activities (timing, location, duration) (Figure 1-4; Table 4-4) with the expected

occurrence of delta smelt in the action area (Table 4-3), as well as the expected fish behavior if encountering underwater noise. An important measure for reducing the potential exposure of delta smelt to pile driving noise is the restriction of in-water impact pile driving activities to May 1 through November 30, a period when the abundance of delta smelt in the construction area is reduced (see Measure 7).

To further minimize direct effects on fish, the project proponents propose to use vibratory driving to drive all piles to the maximum depth possible before using an impact driver to complete the installation and to use sound attenuation measures—including cofferdam dewatering and bubble curtains—and hydroacoustic monitoring to minimize the exposure of special-status fish species to potentially harmful pile driving sounds (Measures 8 and 9). During in-water pile driving activities, the use of an impact driver will be limited to driving only the 16-inch piles that are needed for the piers and abutments of the new bridge, the temporary trestles, and the barges. All of the 108-inch steel casings will be installed with a vibratory hammer and/or hydraulic-driven oscillator/rotator system, and all of the temporary sheet piles for the cofferdams will be installed and extracted using a vibratory driver. Use of a vibratory driver and/or hydraulic-driven oscillator/rotator system to install the 108-inch steel casings and the vibratory driver to install and remove the temporary sheet piles for coffer dams is not expected to produce sound levels that result in injury to fish. Vibratory pile driving is a preferred method for minimizing the exposure of fish to potentially harmful pile driving sounds (National Marine Fisheries Service 2009). Therefore, the following assessment focuses on the potential for injury to fish based on predicted noise levels associated with impact pile driving.

Because geotechnical information is not yet available, it is unknown how far piles would be advanced with a vibratory hammer before impact driving would be needed to complete the installation. Therefore, the following results are based on the estimated maximum number of strikes that would be needed with an impact hammer to fully install each pile and represent a worst-case scenario for underwater sound levels. However, actual underwater sound levels from driving piles would likely be less than those levels reported here because some portion of the pile installation is expected to be accomplished with a vibratory hammer, thereby reducing the total number of strikes needed with an impact hammer to install each pile.

Table 4-4. I Street Bridge Hydroacoustic Analysis. 7-13-15

Pile Location	Pile Diameter/ Type	Driver	Total Number of Piles to be Installed	Land or Water Installation	Piles per Day	Engineer's Estimate of Strikes per Pile	Total Strikes per Day	Attenuation (dB)	Underwater Sound Level Assumptions					Cumulative SEL at Reference Distance	Transmission Loss Constant	Distance (m) to Threshold			
																Onset of Physical Injury			Behavior
																Peak	Cumulative SEL dB		RMS
																dB	Fish ≥ 2 g	Fish < 2 g	dB
									Peak	SEL	RMS	Reference Distance (m)	Source for Sound Level Assumptions			206 dB	187 dB	183 dB	150 dB
Abutments 1 and 6	16-in diameter steel	Impact	100	Land	20	800	16,000	0	198	171	183	10	Caltrans 2014. 20-inch steel pipe driven on land near the San Joaquin River.	213	15	<10	251	251	1,585
	16-in square precast concrete (alternative to 16-in diameter steel above)	impact	100	Land	20	800	16,000	0	192	174	181	10	Caltrans 2014. 24-inch octagonal concrete pile driven at the Port of Oakland.	216	15	<10	398	398	1,166
Temporary trestle	16-in diameter steel	Impact	160	Water	20	800	16,000	0	208	176	187	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River.	218	15	14	541	541	2,929
	16-in diameter steel	Impact	160	Water with attenuation system	20	800	16,000	-5	203	171	182	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River. 5 dB attenuation assumed from bubble curtain or dewatered coffer dam.	213	15	<10	251	251	1,359
Temporary trestle	16-in H pile (alternative to 16-in diameter steel pile above)	Impact	160	Water	20	800	16,000	0	195	170	180	10	Caltrans 2014. 15-inch steel H thick driven at Ballena Isle Marina.	212	15	<10	215	215	1,000
	16-in H pile (alternative to 16-in diameter steel pile above)	Impact	160	Water with attenuation system	20	800	16,000	-5	190	165	175	10	Caltrans 2014. 15-inch steel H thick driven at Ballena Isle Marina. 5 dB attenuation assumed from bubble curtain.	207	15	<10	100	100	464
Piers 2 and 5	16-in diameter steel	Impact	100	Inside dewatered cofferdam	20	800	16,000	-5	203	171	182	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River. 5 dB attenuation assumed from dewatered coffer dam.	213	15	<10	251	251	1,359
	16-in square precast concrete (alternative to 16-in diameter steel above)	Impact	100	Inside dewatered cofferdam	20	800	16,000	-5	183	161	171	10	Caltrans 2014. 24-inch octagonal concrete pile driven at the Port of Oakland. 5 dB attenuation assumed from dewatered coffer dam.	203	15	<10	54	54	251
Bridge Fender System	16-in diameter concrete	Impact	60	Water	20	1000	20,000	0	188	166	176	10	Caltrans 2014. 24-inch octagonal concrete pile driven at the Port of Oakland.	209	15	<10	117	117	541
	16-in diameter concrete	Impact	60	Water with attenuation system	20	1000	20,000	-5	183	161	171	10	Caltrans 2014. 24-inch octagonal concrete pile driven at the Port of Oakland. 5 dB attenuation assumed from bubble curtain.	204	15	<10	54	54	251
Spud piles	16-in diameter steel	Impact	8	Water	8	800	6,400	0	208	176	187	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River.	214	15	14	541	541	2,929
	16-in diameter steel	Impact	8	Water with attenuation system	8	800	6,400	-5	203	171	182	10	Caltrans 2014. 20-inch steel pipe driven in the San Joaquin River. 5 dB attenuation assumed from bubble curtain.	209	15	<10	251	251	1,359
Piers 3 and 4	108-in steel casings	Vibratory hammer and/or hydraulic driven oscillator/ rotator system	8	Water	2 weeks/ pile	NA	NA	NA	Vibratory pile driving is not known to cause injury to fish and is therefore not evaluated here.										
									Hydraulic oscillator/rotator systems slowly rotate pile into place and do not generate high underwater noise levels.										

Note 1. Cofferdam sheet piles will be driven with a vibratory driver. Vibratory pile driving is not known to cause injury to fish and is therefore not evaluated.
Note 2. There is limited data available for concrete piles driven on land. Data taken from measurements at the Port of Oakland is used. In this case piles driven on land resulted in higher underwater sound levels than piles driven in water.
Note 3. Pile driving energy does not accumulate once the single strike SEL drops to 150 dB (i.e. "effective quiet"). The distance to the onset of physical injury therefore cannot extend beyond the distance to "effective quiet." Once the daily number of strikes exceeds 5,000 strikes per day the distance to the onset of injury does not increase.
For this reason the distances to the 183 dB and 187 dB thresholds are the same.

Injury Thresholds for Pile Driving Noise

The ability to predict impacts of pile driving noise on listed fish species is currently limited by a lack of information on the key variables and mechanisms linking pile driving sounds with the biological responses of the species of concern (Popper and Hastings 2009). Beginning in 2004, Caltrans—in coordination with the FHWA, Oregon Department of Transportation, and Washington Department of Transportation—established a Fisheries Hydroacoustic Working Group (FHWG) to coordinate and improve information related to the assessment of underwater noise impacts on fish from pile driving. Other member agencies include NMFS (West Coast Region [formerly Northwest and Southwest Regions]), USFWS, and CDFW.

The following assessment is based on application of interim noise criteria established by the FHWG in 2008 (Table 4-5). These criteria, based on recommendations developed by Popper at al. (2006) and revised by Carlson et al. (2007), are considered preliminary thresholds for assessing the potential for injury to listed fish species. The peak sound pressure level (SPL) is considered the maximum SPL a fish can receive from a single strike without injury. The cumulative sound exposure level (SEL) is considered the total amount of acoustic energy that a fish can receive from a single or multiple strikes without injury. Insufficient data are currently available to support the establishment of a noise threshold for behavioral effects (Popper et al. 2006); however, NMFS generally assumes that a noise level of 150 decibels root mean square (dB RMS) is an appropriate threshold for behavioral effects; therefore, this criterion is also being used to assess potential project effects on delta smelt behavior. Technical guidance on the application of these criteria to pile driving projects is presented by ICF Jones & Stokes and Illingworth and Rodkin (2009).

Table 4-5. Interim Criteria for Injury to Fish from Pile Driving Activities

Interim Criteria	Agreement in Principle
Peak sound pressure level (SPL)	206 dB re 1µPa (for all sizes of fish)
Cumulative sound exposure level (SEL)	187 dB re 1µPa^2-sec—for fish size ≥ 2 grams 183 dB re 1µPa^2-sec—for fish size < 2 grams
Behavioral (RMS)	150 dB re 1µPa (for all sizes of fish)

dB = decibel(s)
dB re 1µPa = dB referenced to a pressure of 1 microPascal
dB re 1µPa^2-sec = dB referenced to a pressure of 1 microPascal squared per second
RMS = root mean square

The potential for physical injury to fish from exposure to pile driving sounds was evaluated using the "NMFS Pile Driving Calculator," a spreadsheet model developed by NMFS to calculate the distances from the pile that sound attenuates to the peak or cumulative criteria. These distances define the area in which the criteria are expected to be exceeded as a result of impact pile driving (potential impact area). The NMFS spreadsheet calculates these distances based on estimates of the single-strike sound levels for each pile type (measured at 10 meters

[32.8 feet] from the pile) and the rate at which sound attenuates with distance. To account for the exposure of fish to multiple pile driving strikes, the model computes a cumulative SEL for multiple strikes based on the single-strike SEL and the number of strikes per day or pile driving event. Estimated single-strike sound levels were based on measured sound levels produced by similar piles (California Department of Transportation 2009). The standard sound attenuation rate of 4.5 dB per doubling of distance was used in the absence of other data. The estimated number of pile strikes per day was provided by the project engineers. Because delta smelt in the project area could be smaller than 2 grams, the cumulative SEL threshold of 183 dB (i.e., the more protective threshold) is used in this analysis. It should be noted, however, that because the estimated daily number of strikes per day exceeds 5,000 strikes, the distance to the onset of physical injury does not increase because pile driving energy does not accumulate once the single strike SEL drops to 150 dB (i.e., "effective quiet"); therefore, the distance to the 183 dB and 187 dB thresholds are the same (see "Note 3" at bottom of Table 4-4).

16-Inch Piles for Temporary Trestles

A total of 160 (80 per trestle) 16-inch piles would be installed to support trestles for the work platforms during construction. The trestles would be installed over a 3 week period in May in the first year of construction and would remain in place throughout the duration of bridge construction (Figure 1-4). It was assumed that up to 20 piles (4–10 piles per day per pile driver, with two pile drivers operating) would be driven in a day, requiring up to 16,000 strikes with the impact hammer to drive and test each pile (Table 4-4). The piles for the temporary trestles would be removed during October of the second construction season once bridge construction is completed. Two pile types are being considered: 16-inch-diameter steel and 16-inch H piles. Both pile types have been evaluated separately for noise impacts.

16-Inch-Diameter Steel Piles for Temporary Trestles

Impact driving of 16-inch-diameter steel piles is expected to produce a single-strike peak SPL of 208 dB and a single-strike SEL of 176 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4); the single-strike peak SPL exceeds the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend 14 meters (46 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile, with two pile drivers operating), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 541 meters (1,775 feet) away from the source pile. The project proponents propose to use a bubble curtain to reduce this distance to an estimated 251 meters (824 feet) (Table 4-4).

16-Inch H Piles for Temporary Trestles

Impact driving of 16-inch H piles is expected to produce a single-strike peak SPL of 195 dB and a single-strike SEL of 170 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4). The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile, with two pile drivers operating), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 215 meters (705 feet) away from the source pile. The project proponents propose to use a bubble curtain to reduce this distance to an estimated 100 meters (328 feet) (Table 4-4).

16-Inch Piles for Piers 2 and 5

A total of 100 (50 per pier) 16-inch piles would be installed to construct piers 2 and 5 for the two fixed-span approach structures that would tie into the Sacramento and West Sacramento banks of the river (Figure 1-3). The 16-inch piles for piers 2 and 5 would be installed inside dewatered cofferdams that would be constructed to isolate the construction site from the Sacramento River. The piles would be driven over a 1 week period in May in the first construction season (Figure 1-4). It was assumed that up to 20 piles (4–10 piles per day per pile driver, with two pile drivers operating) would be driven in a day, requiring up to 16,000 strikes with the impact hammer to drive and test each pile (Table 4-4). Two pile types are being considered: 16-inch-diameter steel and 16-inch-square precast concrete piles. Both pile types have been evaluated separately for noise impacts.

16-Inch-Diameter Steel Piles for Piers 2 and 5

Impact driving of 16-inch H piles for piers 2 and 5 in the dewatered cofferdams is expected to produce a single-strike peak SPL of 203 dB and a single-strike SEL of 171 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4).The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 251 meters (824 feet) away from the source pile. Because the piles would be driven in dewatered cofferdams, there are no opportunities to further attenuate noise levels.

16-Inch-Square Precast Concrete Piles for Piers 2 and 5

Impact driving of 16-inch-square concrete piles for piers 2 and 5 in the dewatered cofferdams is expected to produce a single-strike peak SPL of 183 dB and a single-strike SEL of 161 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4).The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-5). Peak SPLs above the interim

threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 54 meters (177 feet) away from the source pile. Because the piles would be driven in dewatered cofferdams, there are no opportunities to further attenuate noise levels.

16-Inch Piles for Abutments 1 and 6

A total of 100 (50 per abutment) 16-inch piles would be installed to construct abutments 1 and 6 on the West Sacramento and Sacramento banks of the river, respectively (Figure 1-3). The piles would be installed over a 1 week period in May of the second construction season (Figure 1-4). It was assumed that up to 20 piles (4–10 per day per pile driver, with two pile drivers operating) would be driven in a day, requiring up to 16,000 strikes with the impact hammer to drive and test each pile (Table 4-4). Two pile types are being considered: 16-inch-diameter steel and 16-inch-square precast concrete. Both pile types have been evaluated separately for noise impacts because of their proximity to the river.

16-Inch-Diameter Steel Piles for Abutments 1 and 6

Impact driving of 16-inch-diameter piles for abutments 1 and 6 is expected to produce a single-strike peak SPL of 198 dB and a single-strike SEL of 171 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4). The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 251 meters (824 feet) away from the source pile. Because the piles would be driven on land, there are no opportunities to attenuate noise levels.

16-Inch-Square Precast Concrete Piles for Abutments 1 and 6

Impact driving of 16-inch-square precast concrete piles for abutments 1 and 6 is expected to produce a single-strike peak SPL of 192 dB and a single-strike SEL of 174 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4). The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 16,000 strikes per day (20 piles per day at 800 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 398 meters (1,306 feet) away from the source pile. Because the piles would be driven on land, there are no opportunities to attenuate noise levels.

16-Inch-Diameter Concrete Piles for Bridge Fender System

A total of 60 (30 per pier) 16-inch-diameter concrete piles would be installed at piers 3 and 4 to construct the bridge fender system for the two movable span piers (Figure 3-1). The fender system would protect the piers from errant watercraft navigating the river. The piles would be installed over a 2 week period in October of the second construction season (Figure 1-4). It was assumed that up to 20 piles per day (4–10 piles per day per pile driver, with two pile drivers operating) would be driven in a day, requiring up to 20,000 strikes with an impact hammer to drive and test each pile (Table 4-4).

Impact driving of 16-inch-diameter concrete piles for the bridge fender system is expected to produce a single-strike peak SPL of 188 dB and a single-strike SEL of 166 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4). The single-strike peak SPL and single-strike SEL would not exceed the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend less than 10 meters (32.8 feet) from the source pile. Based on an assumed maximum rate of 20,000 strikes per day (20 piles per day at 1,000 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 117 meters (384 feet) away from the source pile. The project proponents propose to use a bubble curtain to reduce this distance to an estimated 54 meters (177 feet) (Table 4-4).

16-Inch-Diameter Steel Piles for Barge Installation

A total of 8 16-inch-diameter steel piles (spud piles) would be installed to anchor each barge to provide a floating work platform during bridge construction. One to two barges would be used during construction and would be installed over a 1 week period in May of the first and second construction season. The barges would be in use for approximately 24 months and would be moved approximately 4–6 times during anytime of the year. It was assumed that up to 8 piles per day would be driven on the days a barge would be moved, requiring up to 6,400 strikes with an impact hammer to drive each pile (Table 4-4).

Impact driving of 16-inch-diameter steel (spud) piles for the barges is expected to produce a single-strike peak SPL of 208 dB and a single-strike SEL of 176 dB (measured at 10 meters [32.8 feet] from the pile) (Table 4-4); the single-strike peak SPL exceeds the interim criteria (Table 4-5). Peak SPLs above the interim threshold (206 dB) would extend 14 meters (46 feet) from the source pile. Based on an assumed maximum rate of 6,400 strikes per day (8 piles per day at 800 strikes per pile), cumulative SELs exceeding the interim threshold (183 dB for fish ≤ 2 grams) would occur out to 541 meters (1,775 feet) away from the source pile. The project

proponents propose to use a bubble curtain to reduce this distance to an estimated 251 meters (824 feet) (Table 4-4).

108-Inch Steel Casings for Piers 3 and 4

A total of 8 (4 per pier) 108-inch steel casings would be installed to construct piers 3 and 4 for the tower foundations (Figure 1-3). The 108-inch steel casings for piers 3 and 4 would be installed with a vibratory pile driver and/or hydraulic-driven oscillator/rotator system; therefore, this method of installation would not generate high underwater noise levels (Table 4-4). It was assumed that it will take approximately 7 weeks to install both 108-inch steel casings. The 108-inch steel casings would be installed from late May through early July in the first construction season (Figure 1-4).

Sheet Piles for Temporary Cofferdams

Two cofferdams would be installed to construct piers 2 and 5 (Figure 1-3). The sheet piles for the cofferdams would be installed and removed with a vibratory pile driver; therefore, this method of installation and removal would not generate high underwater noise levels (Table 4-4). The sheet piles for the two cofferdams would be installed at the same time over a 2 week period in May of the first construction season (Figure 1-4).

Effects of Pile Driving Noise on Fish

The proposed timing of pile driving activities, use of a vibratory hammer to first drive the piles to the maximum depth possible before using an impact driver to complete the installation, and use of sound attenuation measures are expected to minimize the exposure of delta smelt to potentially harmful pile driving sounds. Generally, the potential for injury or mortality of delta smelt would be greatest for the 16-inch-square precast concrete piles for abutments 1 and 6 and would be the lowest for the 16-inch-square precast concrete piles for piers 2 and 5 driven in dewatered cofferdams and 16-inch-diameter concrete piles driven in water (with attenuation) for the bridge fender system. For the 16-inch-square precast concrete piles for abutments 1 and 6, the potential for injury and mortality would exist within areas of less than 10 meters (32.8 feet) for single-strike exposures and within areas of up to 398 meters (1,306 feet) of the source piles for multiple-strike exposures to impact pile driving sounds. By comparison, for 16-inch-square precast concrete piles for piers 2 and 5 driven in dewatered cofferdams and 16-inch-diameter concrete piles driven in water (with attenuation) for the bridge fender system, the potential for injury and mortality would still exist within areas of less than 10 meters (32.8 feet) of the source piles for single-strike exposures and within areas of up to 54 meters (177 feet) of the source piles for multiple-strike exposures to impact pile driving sounds.

Several factors that could influence the potential exposure and susceptibility of delta smelt to injury from pile driving sounds include the size, mobility, and likely response of the life stages of

concern (adults, eggs, and larvae). Actively migrating adults are expected to be capable of avoiding or migrating through the areas where potential injury or mortality may occur. By contrast, eggs and larvae are not capable of avoiding areas where potential injury or mortality may occur. In addition, because of their larger size (i.e., greater than 2 grams), adult delta smelt would be expected to tolerate higher sound pressures than the levels associated with the onset of injury in smaller fish (Table 4-5), such as larvae or small juveniles (if they occur in the project area). At a minimum, any adults encountering pile driving noise may exhibit some form of behavioral response, including an avoidance response that could disrupt or delay their movement or feeding. Evidence suggests that some fish species avoid or disperse from areas subject to pile driving or other human-generated noises (Popper and Hastings 2009).

Installation of the temporary trestle piles and piles for piers 2 and 5 in May of the first year of construction presents the greatest concern for the potential of injury and mortality of delta smelt from pile driving noise because of the relatively large number of piles (i.e., approximately 160 total piles) that would be installed, the relatively large channel area that would be subject to cumulative sound levels exceeding the injury thresholds (Table 4-4), and potential for adults, eggs, and larvae to be present. In addition, relocation of the construction barges is of concern if impact driving is required to install the spud piles to anchor the barges during primary periods of species and life stage occurrence. However, unlike pile driving associated with the temporary trestles and bridge piers, pile driving associated with relocation of the barges would be infrequent (4–6 times over the course of construction) and would require that only 8 piles be driven over the course of one day, per event.

Delta smelt may spawn within or in the vicinity of the action area; therefore, their eggs and larvae may be exposed to underwater noise from pile driving activities. In addition, pile driving activities would overlap with delta smelt adults at the end of the migration and spawning season in May and June, and with larvae and possibly juveniles in May through early July. Pile driving associated with relocating the construction barges outside of May 1 to November 30 could potentially overlap peak migration and spawning periods for delta smelt; however, because it is not known when barges would have to be moved it is not possible to identify which species and life stages potentially would be affected. However, these pile driving activities would be infrequent and last for less than one day per event.

Based on the predicted levels of underwater noise, pile driving activities could lead to injury and/or direct and indirect mortality if individuals are within the range of noise levels that could cause physical harm or behavioral effects that lead to mortality (e.g., from predation). However, only a small proportion of the delta smelt population is likely to be at risk, based on the extent of overlap of pile driving activities with migration timing and the distribution of delta smelt in the

Sacramento River (the action area is located at the northern [upstream] boundary of the species' range).

Although pile driving would occur over many days per season, pile driving would not be continuous and would be limited to daylight hours only, resulting in extended overnight periods each day for migrating fish to pass the construction site undisturbed. In addition, the project proponents propose to drive piles for in-water piers 2 and 5 in dewatered cofferdams and to install the 108-inch-diameter steel casings for in-water piers 3 and 4 using a vibratory hammer and/or hydraulic driven oscillator/rotator system, which would not generate the same underwater noise levels had these piles been driven in water with an impact hammer. Finally, the project proponents will require the contractor to employ sound attenuation devices (e.g., bubble curtains) during in-water pile driving.

Insufficient data are currently available to support the establishment of a noise threshold for behavioral effects (Popper et al. 2006). NMFS generally assumes that a noise level of 150 dB RMS is an appropriate threshold for behavioral effects. During in-water (with attenuation) impact driving of the 16-inch diameter steel piles for abutments 1 and 6, the spreadsheet calculations indicate that underwater sounds exceeding 150 dB RMS would extend 1,585 meters (approximately 1 mile) from the source piles (Table 4-4). However, these calculations assume an unimpeded open water propagation path over this distance, which is not the case for the Sacramento River. The Sacramento River has major river channel bends within about 1,280 meters (4,200 feet) upstream and 1,830 meters (6,000 feet) downstream from the proposed bridge crossing that will result in diffraction and attenuation of sound waves. Thus, the distance within which 150 dB RMS is exceeded likely would be less than indicated in Table 4-4.

Based on the area of disturbance and timing of pile driving operations, some disturbance to the movement and feeding of special-status fish is anticipated. In addition, pile driving activities would not be continuous but would start and stop during the course of each day of pile driving (including cessation of pile driving activities at night), providing opportunities for fish to continue with their movements and feeding without substantial delays. In addition, general construction noise may act to disperse fish away from the construction area before impact driving is initiated.

Increased Exposure to Contaminants

Disturbance and resuspension of river bottom sediments during in-water construction pose a risk to delta smelt because of potential increases in the exposure to contaminated sediments.

Sand, silt, and gravel characterize bottom substrate in the BSA. Non-soluble contaminants with a tendency to adsorb[1] to sediments (as opposed to soluble contaminants which have the tendency to be readily diluted in water) can accumulate in the substrate over time. Non-soluble contaminants that are known to be present in the Sacramento River include polychlorinated biphenyls (PCBs), mercury, pesticides and insecticides (i.e., dieldrin, chlorodane, DDT), and other unknown toxicities (State Water Resources Control Board 2011). Resuspension of sediments with adsorbed metals during in-water construction potentially could lead to degradation of water quality and food resources in the action area. In addition, resuspended particulate material could be transported to other locations in the Sacramento River as a result of transport by river currents, thus leading to potential degradation of water quality and food resources in the action area. Although delta smelt may be present in the action area during May and June, restricting in-water construction to the May 1–November 30 window will reduce the exposure of delta smelt to contaminants because delta smelt occur less frequently than other months, or not at all, during this time of year.

In-water construction would be limited to pile driving, installation and removal of sheet piles for cofferdams, and RSP placement. In addition, in-water construction would be limited to daylight hours each day. Thus, disturbance of channel substrate and the potential for increased contaminants would be temporary and localized. Assuming that mobilization of sediment is also an indication of contaminant mobilization, the proposed in-water construction methods and construction BMPs should minimize the increase in contaminants in the river.

Given the relatively short exposure time and the restricted area of in-water construction relative to the distribution and temporal occurrence of adult and juvenile delta smelt between May 1 and November 30, the effect of contaminants mobilized by in-water construction is not expected to result in measurable effects on the survival and growth of delta smelt.

Contaminant Spills

Construction activities that occur in or near the Sacramento River channel can result in the discharge of contaminants that are potentially lethal to fish, including delta smelt. The operation of heavy equipment, cranes, pile drivers, drilling rigs, tug boats, and other construction equipment during bridge construction can result in spills and leakage of fuel, lubricants, hydraulic fluids, and coolants. Other sources of potential contamination include asphalt, wet concrete, and other materials that may come into direct contact with surface water during construction activities. For example, concrete that is being poured for the bridge decking could

[1] *Adsorption* is the adhesion of atoms, ions, or molecules from a gas, liquid, or dissolved solid to a surface—in this case, a sediment particle.

be discharged accidentally to the river, thereby contaminating the river with uncured concrete (which can raise pH) and related compounds.

The potential magnitude of biological effects resulting from contaminants depends on a number of factors, including the proximity of spills to the river; the type, volume, concentration, and solubility of the contaminant; and the timing and duration of the spill or release of the contaminant into the water column. Contaminants can affect survival, growth, and reproductive success of fish and other aquatic organisms. The level of effect depends on the species, life stage sensitivity, duration of exposure, condition or health of exposed individuals, and the physical and chemical properties of the water (e.g., temperature, pH, dissolved oxygen, and other factors).

Implementation of Measure 10 would eliminate or minimize the risk of contaminant spills and the potential effects of any spills on fish, including delta smelt, and other aquatic organisms.

Erosion and Mobilization of Sediment

Site clearing, earthwork, driving of permanent piles, driving and removal of piles for the temporary trestles, and vibrating and removal of sheet piles for cofferdams will result in disturbance of soil and riverbed sediments, resulting in temporary increases in turbidity and suspended sediments in the Sacramento River. In addition, dewatering and soil removal from the inside of the cofferdams could result in temporary increases in turbidity and suspended sediments in the river, if water (and associated spoils) from within the cofferdams is not properly disposed of or contained and treated before being discharged back to the river.

The potential for disturbance of riverbed sediments and associated increases in sedimentation and turbidity in the Sacramento River are anticipated to be greatest during activities to extract the piles used for the temporary trestles and cofferdams. These activities would result in greater disturbance to riverbed sediments than would occur during pile driving for piers and the bridge fender system; these piles would be driven only and not extracted.

In addition to increasing exposure to contaminants as discussed previously, elevated levels of suspended sediments have the potential to result in physiological, behavioral, and habitat effects related to increased sediment concentrations in the water column. The severity of these effects depends on the sediment concentration, duration of exposure, and sensitivity of the affected life stage. Short-term increases in turbidity and suspended sediment may disrupt normal behavior patterns of fish, potentially affecting foraging, rearing, and migration. The level of disturbance may also cause juveniles to abandon protective habitat or reduce their ability to detect predators, potentially increasing their vulnerability to predators (e.g., striped bass and largemouth bass). Previous studies have documented these effects. For example, juvenile salmonids have been observed to avoid streams that are chronically turbid (Lloyd et al. 1987) or move laterally or

downstream to avoid turbidity plumes (Sigler et al. 1984). Bisson and Bilby (1982) reported that juvenile coho salmon avoid turbidities exceeding 70 nephelometric turbidity units (NTUs). Chronic exposure to high turbidity and suspended sediment may affect growth and survival by impairing respiratory function, reducing tolerance to disease and contaminants, and causing physiological stress (Waters 1995). Sigler et al. (1984) found that prolonged exposure to turbidities between 25 and 50 NTUs resulted in reduced growth and increased emigration rates of juvenile coho salmon and steelhead compared to controls. Increased sediment delivery can also smother aquatic invertebrates (a fish food item), degrade forage habitat, and reduce cover for juvenile fish.

Delta smelt eggs may be at higher risk of exposure to construction-related impacts than other life stages because their benthic nature may make them more likely to encounter sediment plumes that may be more concentrated near the river bottom.

Implementation of Measure 10 would eliminate or minimize the potential for mobilization of sediment and increased sedimentation and turbidity in the Sacramento River. Some harassment of adult and juvenile fish may occur due to temporary, localized plumes of sediment during pile driving and installation and removal of temporary piles and sheet piles. Turbidity would be monitored throughout in-water construction (Measure 11).

Temporary and Permanent Loss of Aquatic Habitat

The proposed project would include the placement of temporary and permanent fill (bridge piers and RSP) below the OHWM and would result in the permanent and temporary loss of aquatic habitat area and volume, including spawning, larval and juvenile transport, rearing, and adult migration habitat for delta smelt. A total of up to 1.85 acres of permanent impacts on perennial stream and delta smelt habitat in the Sacramento River would result from the following bridge components and RSP to be placed below the OHWM (see Table 4-6 below).

- The two fixed-span approach structures for the new bridge would be constructed on center piers (Piers 2 and 5) with foundations each consisting of 50 driven or CIDH piles. The piles would be covered by pile caps and RSP. The footprint for Piers 2 and 5 on the river bottom would total 8,500 square feet (0.20 acre).
- The movable span section of the bridge would be constructed on a foundation of four 9-foot diameter CISS piles in the river bed. The CISS piles, consisting of hollow steel shells, would be driven into the channel bottom using drivers and cranes on the temporary trestle or mounted on barges to temporarily place the steel shells at the desired location for each pile. Once the steel shells are in place, the soil inside the shell would be drilled out, and concrete would be poured into the dewatered hollow shells. The piles would be covered by pile caps

and RSP. The footprint for r Piers 3 and 4 on the river bottom would total 1,864 square feet (0.04 acre).

- A bridge fender system would be constructed around the movable span piers that would include approximately 30 driven piles around each pier. The footprint of the bridge fender system on the river bottom would total 85 square feet (0.002 acre).
- RSP (1/4-ton, Method B) would be installed along 1,600 linear feet of shoreline (900 linear feet on City of Sacramento shoreline and 700 linear feet on City of West Sacramento shoreline) below the OHWM. The total volume and area of RSP that would be placed below the OHWM would be up to 2,000 cubic yards and 70,000 square feet (1.61 acres), respectively. In addition, a total of up to 2,000 cubic yards of RSP would be placed above the OHWM.

Table 4-6. Amount of Temporarily and Permanently Affected Aquatic Habitat in the Sacramento River Resulting from the Proposed Project

Feature/Habitat	Temporary Impact	Permanent Impact
Temporary Cofferdams		
Substrate Area (square feet [acre])	4,000 [0.09]	NA
Water Column Volume (cubic feet)	73,640	NA
Temporary Trestle Piles		
Substrate Area (square feet [acre])	197 [0.005]	NA
Water Column Volume (cubic feet)	3,573	NA
Piers 2 and 5		
Substrate Area (square feet [acre])	NA	8,500 [0.20][1]
Water Column Volume (cubic feet)	NA	12,250
Piers 3 and 4		
Substrate Area (square feet [acre])	NA	1,864 [0.04][2]
Water Column Volume (cubic feet)	NA	17,800
Piles for Bridge Fender System		
Substrate Area (square feet [acre])	NA	85 [0.002]
Water Column Volume (cubic feet)	NA	2,600
Shoreline Rock Revetment (RSP)		
Substrate Area (square feet [acre])	NA	70,000 [1.61]
Water Column Volume (cubic feet)	NA	NA
TOTALS		
Substrate Area (square feet [acre])	4,197 [0.095]	80,449 [1.85]
Water Column Volume (cubic feet)	77,213	32,650

NA = Not applicable
[1] 2,500 sf (pile caps) + 6,000 sf (RSP)
[2] 64 sf (piles) + 1,800 sf (RSP)

Temporary impacts on perennial stream and delta smelt habitat would also occur from temporary installation of two cofferdams and trestle piles during bridge construction. Installation of sheet pile cofferdams to isolate the in-water construction areas for piers 2 and 5 from the water column during pier construction would result in the temporary loss of aquatic habitat (substrate and water column) equal to the enclosed area and volume of the in-water cofferdams. The cofferdams would remain in place only during construction of the new bridge piers. The proposed

dimensions of each cofferdam are 25 feet by 80 feet, or 2,000 square feet. Together, the two cofferdams would result in a temporary loss of 4,000 square feet (0.09 acre) of substrate habitat and up to 73,640 cubic feet of water column habitat below the OHWM (based on a water surface elevation of +20 feet).

Approximately 141 16-inch-diameter pipe or H piles would be installed below the OHWM to support the temporary trestles, and would result in a temporary loss of 197 square feet (0.005 acre) of substrate habitat and up to 3,573 cubic feet of water column habitat below the OHWM. (Approximately 19 of the 160 piles for the temporary trestles would be installed above the OHWM). The temporary trestle piles would remain in place throughout the duration of construction.

Installation of these features may result in direct and indirect effects by inhibiting establishment of riparian vegetation; inhibiting recruitment and retention of sediment and woody debris; and eliminating shallow-water habitat.

Compensation for impacts on perennial stream, as described below, would offset the effects of temporary and permanent impacts on delta smelt habitat.

Temporary and Permanent Loss of Cottonwood Riparian Habitat (including SRA Cover Habitat)

Clearing of the existing cottonwood riparian forest vegetation within the proposed project footprint would result in the permanent loss of up to 1.44 acres and temporary loss of up to 1.52 acres of cottonwood riparian forest within the BSA, of which approximately 0.44 acre is below the OHWM and contributes to overhead (shade) and instream SRA cover (see additional discussion below regarding SRA cover). The permanent loss of existing cottonwood forest would result from activities related to construction of the two fixed-span bridge approach structures, the bikeway along Jibboom Street in the City of Sacramento, and the new residential access road connecting B Street and 3rd Street in the City of West Sacramento (Figure 3-1). The temporary loss of cottonwood riparian forest would occur from trimming riparian vegetation and removing additional trees and understory vegetation to provide equipment access. Portions of this affected riparian forest also provide SRA cover habitat that is an important component of anadromous fish habitat (see additional discussion below). Clearing of the existing cottonwood riparian forest that contributes to SRA cover would result in the temporary and permanent loss of up to 890 linear feet (i.e., up to 513 linear feet on the City of Sacramento side of the Sacramento River and up to 377 linear feet on the City of West Sacramento side of the Sacramento River) of overhead SRA cover (shade) along the summer (low-flow) shoreline of the Sacramento River.

Riparian vegetation is important in controlling stream bank erosion, contributing to instream structural diversity, and maintaining undercut banks. In addition, canopy cover (overhanging

vegetation [a form of SRA cover]) maintains shade that is necessary to reduce thermal input and provides an energy input to the aquatic habitats in the form of fallen leaves and insects (a food source for fish). SRA cover also provides fish with protection from predators in the form of undercut banks, branches, roots, and instream woody material (e.g., logs).

Without appropriate mitigation, removal of streamside vegetation is likely to degrade the quality of aquatic habitat in the Sacramento River. The amount of existing riparian and SRA cover habitat in the BSA and in the region is of variable quality because of past and ongoing impacts, including levee construction and bank protection activities (i.e., placement of rock revetment).

USFWS mitigation policy identifies California's riparian habitats, including SRA cover habitat, in Resource Category 2. The designation criteria for habitat in Resource Category 2 is "habitat to be impacted is of high quality for evaluation species and is relatively scarce or becoming scarce on a national basis or in the ecoregion section" (U.S. Fish and Wildlife Service 2015c), for which "no net loss of in-kind habitat value" is recommended (46 FR 7644, January 23, 1981). In addition, NMFS recommends re-vegetating onsite at a 3:1 ratio (3 units replaced for every 1 unit of affected habitat) with native riparian species to facilitate the development of SRA cover habitat (Rea pers. comm.).

Compensation for impacts on riparian habitat, including SRA cover habitat, as described below, would offset the effects of temporary and permanent loss of cottonwood riparian forest and SRA cover in the project area.

Fish Entrapment in Cofferdams

Cofferdams would be required in order to construct piers 2 and 5 for the new bridge. Cofferdams would be constructed of sheet piles; when installed, each cofferdam would be approximately 25 feet wide and 80 feet long. The potential exists for entrapment and mortality of delta smelt following closure and dewatering of the cofferdam. The proposed timing of cofferdam installation (May) would potentially overlap adult and juvenile occurrence in the river. Implementation of Measures 12 and 13 will minimize or avoid the risk of mortality for delta smelt potentially stranded during cofferdam installation, closure, and dewatering.

Increase in Direct Lighting on Sacramento River

Temporary lighting of work areas to facilitate nighttime construction, especially at construction sites adjacent to or over the Sacramento River, may result in increased nighttime light intensity on the water surface of the Sacramento River. Increases in direct lighting of the Sacramento River at night may affect the migratory behavior of fish; alter behavior of animals that prey on fish (e.g., piscivorous birds, mammals, and fish) in adjacent and affected habitats; or make juvenile fish more visible to predators, thereby leading to increased mortality of fish through

increased predation (Tabor et al. 2001). Implementation of Measure 15 would minimize the potential for effects of lighting on fish, including delta smelt, by requiring shielding and focusing of temporary lights on work areas to avoid and minimize the amount of nighttime lighting that directly radiates on to the Sacramento River, to the extent practicable.

Indirect Effects

Construction of the bridge would not promote or allow for urban or commercial development or expand boating or other recreational activities in the action area; therefore, no indirect effects related to additional development and use of the Sacramento River would occur.
Potential indirect effects on delta smelt and habitat include changes in impervious surface area and storm runoff, predator/competitor abundance or efficiency, and habitat suitability as a result of over-water structure (artificial shade). These indirect effects are discussed below.

Increases in Impervious Surface Area and Storm Water Runoff

The proposed project would result in added impervious surface which would have the potential to increase runoff volume in the Sacramento River. Increased traffic loads on the new bridge resulting from improved access could result in increased deposition of particulates onto the bridge deck that could then be transported to the Sacramento River with road runoff.

Heavy metals, oil, grease, and polycyclic aromatic hydrocarbons (PAHs) are common pollutants in road runoff. Some of these pollutants can accumulate in stream sediments with lethal and sublethal consequences for fish and other aquatic species, particularly during “first flush” rain events. PAHs are organic compounds—containing only carbon and hydrogen—that occur in motor vehicle exhaust, petroleum products, materials associated with asphalt, and various other municipal and industrial sources. PAHs are widely distributed in the environment and are important environmental pollutants because of their carcinogenicity and tendency to bioaccumulate. PAHs are readily absorbed by fish and other aquatic organisms and, depending on concentration, can lead to lethal and deleterious sublethal effects in these organisms (Tuvikene 1995). PAHs tend to adsorb to any particulate matter, including fine sediment; therefore, relative concentrations of PAHs in aquatic ecosystems are generally highest in sediments, followed by aquatic biota and the water column (Tuvikene 1995). There is evidence that urban runoff containing roadway sediment may be an important PAH input to aquatic habitats and that a significant contribution to the PAH content of roadway sediment comes from materials associated with asphalt (Wakeham et al. 1980).

Although the new bridge would represent added impervious surface area, the proposed project would not result in a substantial increase in impervious surface area in the BSA relative to existing conditions. The new bridge would replace the vehicle portion of the existing I Street Bridge, and existing traffic would be re-routed to the new bridge. In addition, storm water runoff

from the new bridge would be directed to the existing storm water collection systems. Therefore, it is not anticipated that a decrease in water quality from added impervious surface area would be an indirect effect of the proposed project.

Increase in Overwater Structure (Artificial Shade)

Overwater structures can alter underwater light conditions and provide potential holding conditions for juvenile and adult fish, including species that prey on juvenile fishes. Temporary shading attributable to the presence of the temporary trestles, work platforms, and barges during bridge construction and permanent shading from the new bridge potentially could reduce primary productivity of affected habitats. Temporary shading also could increase the number of predatory fishes (e.g., striped bass, largemouth bass) holding in the BSA and/or their ability to prey on delta smelt. Because the temporary trestles, work platforms, and barges would be present only during construction, effects of trestle, work platform, and barge shading would be temporary and localized.

Barge shading would occur year-round during construction of the new bridge. One to two barges, each approximately 60 feet wide and 190 feet long (11,400 square feet [0.26 acre]), would be present during construction and would provide a total of 11,400–22,800 square feet (0.26–0.52 acre) of temporary over-water structure (Table 4-7). Because the barges would be present only during construction and moved periodically as construction of the bridge progresses, effects of barge shading would be temporary and localized.

Table 4-7. Amount of Artificial Overwater Structure (Shade) on the Sacramento River under Existing and With-Project Conditions

Overwater Structure	Square Feet of Shaded Area		
	Existing Conditions	With-Project Conditions (Barge/Trestle/Bridge)	Change
Barge (Temporary)	0	11,400–22,800[a]	+11,400–22,800[a]
Trestle (Temporary)	0	30,000	+30,000
Bridge (Permanent)	0	55,000	+55,000
Net Change (Temporary)			+41,400–52,800a
Net Change (Permanent)			+55,000

NA = Not Applicable.
[a] 1 barge–2 barges.

Shading by the temporary trestles and work platforms would occur year-round during construction of the new bridge. Two trestles, approximately 30 feet wide and varying in length and configuration (Figure 1-3), would be present during construction and would provide a total of approximately 30,000 square feet (0.69 acre) of temporary over-water structure (Table 4-7). Because the trestles and work platforms would be present only during construction, effects of trestle shading would be temporary and localized. Together, the barges and temporary trestles

would create up to 52,800 square feet (1.21 acres) of temporary overwater structure (i.e., shade) (Table 4-7).

The new bridge would create approximately 55,000 square feet (1.26 acres) of permanent over-water structure where no over-water structure currently exists. The increased shading created by the new bridge could potentially affect predation rates on delta smelt by creating conditions favored by predatory species. Because of the height of the new bridge over the water, ambient light levels generally would be expected to penetrate into the water, thereby minimizing the effect of bridge shading on aquatic habitats in the Sacramento River. Compensation for the permanent loss of designated critical habitat for anadromous species, as described in the NMFS BA for the project, would offset the effects of bridge shading on aquatic habitats in the Sacramento River.

Introduction of Aquatic Invasive Species

During construction, the operation of barges and other in-water equipment originating from regions or areas outside the project area could result in the introduction and spread of aquatic invasive species (AIS), including the Asian overbite clam (*Corbula amurensis*), quagga mussel (*Dreissena bugensis*), zebra mussel (*Dreissena polymorpha*), hydrilla (*Hydrilla verticillata*), and Brazilian elodea (*Egeria densa*) (California Department of Fish and Game 2008). These species can adversely affect native fishes and other ecologically and economically important species through a number of mechanisms, including competition for resources, predation, parasitism, interbreeding, disease transmission, or changes in the physical or chemical attributes of aquatic habitat. The project proponent will address this impact by implementing Measure 14.

Increase in Direct Lighting on Sacramento River

Permanent lighting associated with the new bridge may result in increased nighttime light intensity on the water surface of the Sacramento River. Increases in direct lighting of the Sacramento River from permanently lighting may have the same effects on fish as described above for temporary lighting, except that the effects associated with permanent lighting of the new bridge could occur indefinitely. Implementation of Measure 15 would minimize the potential for effects of lighting on fish, including delta smelt, by requiring shielding and focusing of permanent bridge lighting on the bridge only to avoid and minimize the amount of nighttime lighting that directly radiates on to the Sacramento River, to the extent practicable.

Impacts on Delta Smelt Critical Habitat

As stated earlier, the Sacramento River upstream of the existing I Street Bridge (upstream boundary of the legal Delta) is not designated as critical habitat for delta smelt as it does not lie within the boundaries of the legal Delta (59 FR 65256; December 19, 1994); only that portion of the action area (defined in Chapter 3) that occurs downstream of the existing I Street Bridge,

which is downstream of the proposed crossing of the new bridge, is designated as critical habitat for delta smelt. Consequently, there would be no permanent effects on designated critical habitat for delta smelt from in-water construction of the new bridge. However, construction-related effects may extend far enough downstream to affect delta smelt critical habitat in the action area downstream of the existing I Street Bridge. Construction-related effects with potential to affect designated critical habitat for delta smelt include temporary effects on the water column (underwater noise and sound pressure, and water quality impacts). These impacts would be the same as those described above for delta smelt.

4.3.1.5 Modifications to the Project to Mitigate Effects

Implementation of Measure 16 would compensate for the permanent loss of perennial stream. Compensation for the permanent loss of perennial stream would also compensate for the loss of delta smelt habitat from the placement of permanent fill. In addition, compensation for the permanent loss of designated critical habitat for anadromous salmonids and green sturgeon, as described in the NMFS BA, would also benefit delta smelt. The project proponents will also comply with any regulatory requirements, including riparian habitat mitigation, determined as part of the Lake or Streambed Alteration Agreement (LSAA) for work that would affect the bed, channel, or bank of the Sacramento River. Consequently, Measure 17 would compensate for loss of riparian vegetation and SRA cover.

Measure 16: Compensate for Loss of Perennial Stream

The project proponents will comply with any regulatory requirements determined as part of the state (Section 401 Water Quality Certification or WDRs, LSAA) and federal (Section 404 and Section 10 permits) processes for the work that would occur in the Sacramento River. The project proponents will compensate for the permanent fill of up to 1.85 acres of other waters of the United States in the Sacramento River by purchasing mitigation bank credits, which can be in the form of preservation and/or creation credits using the following minimum ratios.

A minimum of 2:1 (2 acres of mitigation for each acre filled), for a total of up to 3.7 acres, if credits are for preservation of habitat; or,

A minimum of 1:1 (1 acre of mitigation for each acre filled), for a total of up to 1.85 acres, if credits are for creation of habitat.

The actual compensation ratios will be determined through coordination with the Central Valley RWQCB and USACE as part of the permitting process. The project proponents will compensate for permanent loss of perennial stream by implementing one or a combination of the following options.

Purchase credits for created riparian stream channel at a USACE- approved mitigation bank with a service area that encompasses the project area, such as the Cosumnes Floodplain Mitigation Bank, Fremont Landing Conservation Bank, or Elsie Gridley Mitigation Bank. The project proponents will provide written evidence to the resource agencies that compensation has been established through the purchase of mitigation credits.

Compensate out-of-kind for loss of perennial stream by implementing compensatory mitigation for cottonwood riparian forest impacts described in Measure 4. The acreage restored or created to compensate for loss of perennial stream will be added to the acreage restored or created for loss of riparian habitat.

Measure 17: Compensate for Temporary Effects to and Permanent Loss of Cottonwood Riparian Forest (including SRA Cover)

The project proponents will compensate for the permanent loss of up to 1.44 acres of riparian forest. In addition, any unavoidable temporary loss of riparian forest will be mitigated. The project proponents will implement onsite and, if necessary, offsite compensation measures and/or purchase mitigation bank credits to compensate for losses of cottonwood riparian forest on the waterside slope of the existing levees, including riparian forest supporting SRA cover habitat (as described above, portions of the cottonwood riparian forest in the BSA also provide SRA cover habitat for fish). Onsite compensation will be used to the maximum extent practicable. Compliance with the USACE levee vegetation policy (U.S. Army Corps of Engineers 2014), the ULDC (California Department of Water Resources 2012), or other engineering constraints may limit the ability to achieve full onsite compensation. Therefore, offsite compensation and/or purchase of mitigation bank credits may be needed to achieve no net loss of existing in-kind riparian and SRA cover habitat values. Each of these options is discussed below.

1. **Onsite and/or Offsite Restoration and/or Enhancement along the Sacramento River.** Riparian habitat restoration and/or enhancement onsite or offsite should occur in the same year construction is completed. For onsite or offsite replacement plantings, the project proponents will prepare a mitigation planting plan, including a species list and number of each species, planting locations, and maintenance requirements. Plantings will consist of cuttings taken from local plants or plants grown from local material. Planted species for the mitigation plantings will be similar to those removed from the project area and will include native species, such as Fremont cottonwood, valley oak, black walnut, Oregon ash, boxelder, and black willow. The final planting plan will be developed based on results of the arborist survey for species to be removed (see additional discussion below). All plantings will

be fitted with exclusion cages or other suitable protection from herbivory. Plantings will be irrigated for up to 3 years or until established. Plantings will be monitored annually for 3 years or as required in the project permits. If 75 percent of the plants survive at the end of the monitoring period, the re-vegetation will be considered successful. If the survival criterion is not met at the end of the monitoring period, planting and monitoring will be repeated after mortality causes have been identified and corrected.

2. **Mitigation Bank Credit Purchase.** If this option is chosen, the project proponents will provide written evidence to the resource agencies that compensation has been established through the purchase of mitigation credits. The amount to be paid will be the fee that is in effect at the time the fee is paid. The mitigation will be approved by CDFW and may be modified during the permitting process. Mitigation can be in the form of creation and/or preservation credits. If mitigation is in the form of restoration/creation credits, the mitigation will be at a minimum ratio of 1:1 (1 acre of restored or created riparian habitat for each acre of riparian habitat removed). If mitigation is in the form of preservation credits, the mitigation will be at a minimum ratio of 2:1 (2 acres of preserved riparian habitat for each acre of riparian habitat removed). The final compensation ratio will be approved by CDFW in order to result in no net loss of riparian habitat. The project proponent will purchase riparian habitat credits from an approved mitigation bank near the project, such as the Cosumnes Floodplain Mitigation Bank, Fremont Landing Conservation Bank, or Elsie Gridley Mitigation Bank. Replacement riparian forest habitat will include trees species that would support nesting Swainson's hawk (i.e., oak, cottonwood) and will occur within the range of nesting Swainson's hawk within the Sacramento Valley.

To provide a more accurate estimate of tree loss, an arborist survey will be conducted upon completion of 90% design plans for the project. In addition to a description of the tree, the arborist survey report will include the precise location of the trunk and size of the dripline for all trees whose trunk or canopy overlap with the project footprint. Riparian forest compensation will be consistent with the requirements of the City of West Sacramento and City of Sacramento tree ordinances to ensure compensation for losses of individual protected trees.

In addition to mitigating for the loss of riparian forest habitat, specific measures will be included to compensate for the loss of SRA cover (area and linear feet). However, the acreage will not be duplicated, such that the acreage of riparian forest habitat restored for

SRA cover mitigation will apply towards riparian forest habitat mitigation requirements. SRA cover mitigation will include the following riparian replacement requirements:

Replace the 890 linear feet and 0.44 acre of affected SRA cover vegetation (see "Temporary and Permanent Loss of Cottonwood Riparian Habitat (including SRA Cover Habitat") at a 3:1 replacement ratio (i.e., 3 linear feet replaced for every 1 foot affected and 3 acres replaced for every acre affected) by planting native riparian trees in temporary impact areas and along existing onsite or offsite unshaded banks along the Sacramento River.

Plant native riparian trees onsite to the maximum extent practicable, followed by planting on adjacent reaches of the Sacramento River to minimize the need for purchasing offsite mitigation bank credits.

Plant riparian trees that are intended to provide SRA cover along the water's edge at summer low flows up to the OHWM and at sufficient densities to provide shade along at least 85 percent of the bank's length when the trees reach maturity. This will ensure that riparian plantings intended for SRA cover mitigation will contribute to instream SRA cover when they are inundated during winter/spring flows and overhead cover (shade) during summer flows when they approach maturity.

Monitor and evaluate the re-vegetation success of riparian plantings intended for SRA cover mitigation as described above.

If mitigation for SRA cover is in the form of offsite mitigation bank credits, credits will need to be purchased from an approved mitigation bank within the approved service area for the project that provides riparian forest floodplain conservation credits as off-site compensation for impacts on state- and federally-listed fish species, designated critical habitat, and EFH for Pacific salmon.

4.3.1.6 Cumulative Effects

Under the ESA, cumulative effects are "those effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area of the federal action subject to consultation" (50 CFR 402.2). Future federal actions that are unrelated to the proposed action are not considered in this assessment because they require separate consultation pursuant to Section 7 of the ESA.

Caltrans is not aware of any future state or private activities that are reasonably certain to affect delta smelt or designated critical habitat within the area potentially affected by the proposed project.

4.4 Interrelated and Interdependent Actions

Caltrans does not anticipate any interrelated or interdependent actions associated with the proposed project.

Chapter 5 Conclusions and Determinations

5.1 Conclusions

5.1.1 Valley Elderberry Longhorn Beetle

Construction activities, which include the construction of the roads associated with the new I Street Bridge and the demolition of the existing approach structures, would result in direct impacts on five elderberry shrubs with a total of 26 stems greater than 1 inch in diameter and indirect effects on two elderberry shrubs. No VELB exit holes were observed on any of these shrubs.

Implementation of avoidance and minimization measures, described above under Section 4.2.1.3, prior to and during construction will minimize effects on the two shrubs outside of the construction footprint and provide for the transplantation of the five directly affected shrubs to a mitigation bank. These shrubs will also be compensated for by planting elderberry seedlings and associated natives at the mitigation bank, as described in Section 4.2.1.5.

5.1.2 Delta Smelt

Direct adverse effects of the proposed project on delta smelt are expected to occur largely from underwater noise levels generated by the proposed pile driving activities that are predicted to reach levels that can cause harassment, injury, and mortality of fish, depending on a number of factors that influence exposure levels of fish to pile driving noise. In addition, cofferdam construction and dewatering may cause injury and mortality of fish that become entrapped in cofferdams as they are being installed. Turbidity and suspended sediment levels during in-water construction activities (cofferdam installation and pile driving) are expected to reach levels that can cause harassment of delta smelt, potentially resulting in behavioral responses that could disrupt migration and spawning. Temporary construction lighting could alter the behavior and movements of delta smelt or attract predators to work areas, leading to increased predation. Direct effects on delta smelt may also result from the permanent and temporary loss of aquatic (substrate and water column) habitat associated with the new bridge piers and temporary piles, respectively, and from the permanent loss of SRA cover habitat associated with construction of the new bridge. Indirect adverse effects on delta smelt may occur from the increase in overwater structure (shade) and increased nighttime light intensity from permanent bridge lighting that may make predators more successful at preying on delta smelt.

The project proponents propose to implement a number of measures to avoid or minimize potential adverse effects on delta smelt. All in-water construction activities will be conducted between May 1 and November 30 to avoid or minimize construction effects on delta smelt.

Increased turbidity and suspended sediment would be limited to temporary, localized plumes of sediment during installation and removal of temporary trestle and sheet piles, during the installation of permanent 108-inch-diameter piles for piers 3 and 4 and the permanent piles for the bridge fender system, and during in-water placement of RSP. Because of the potential presence of delta smelt during proposed pile driving activities, the project proponents propose to implement a number of measures to minimize harassment and the risk of injury or mortality from elevated underwater sounds levels. Potential harassment, injury, and mortality of delta smelt from pile driving noise would be minimized by completing all pile driving activities within the proposed construction work window, using vibratory drivers to drive piles to the maximum possible depth , using a bubble ring or similar device to attenuate impact pile driving sounds to the maximum extent feasible, driving of piles for piers 2 and 5 in dewatered cofferdams, using a vibratory hammer and/or hydraulic driven oscillator/rotator system to install the 108-inch-diameter steel casings for piers 3 and 4, conducting pile driving during daylight hours only to provide a harassment-free period each day, and avoiding removing and re-installing the piles for the temporary trestles between the first and second construction seasons. To ensure that underwater sound levels do not exceed predicted values, the project proponents will develop and implement a NMFS-approved hydroacoustic monitoring plan to monitor underwater noise levels during impact pile driving activities (Table 4-4).

5.1.3 Delta Smelt Critical Habitat

Project effects on delta smelt critical habitat include temporary construction-related effects on water column habitat (underwater noise) and water quality (potential increase in turbidity and suspended sediment) downstream of construction. Because of the temporary nature of construction activities and minimal effect of the project on habitat structure and function downstream of the existing I Street Bridge, no long-term effects on the PCEs or conservation value of critical habitat in the region would be expected.

5.2 Determination

5.2.1 Valley Elderberry Longhorn Beetle

The proposed project is *likely to adversely affect* VELB based on the potential for “take” of VELB when elderberry shrubs are removed. To minimize indirect effects, the project proponents will implement avoidance and minimization measures described above under Section 4.2.1.3 prior to and during construction and will compensate for effects on VELB as described under Section 4.2.1.5.

5.2.2 Delta Smelt

The proposed project is *likely to adversely affect* delta smelt based on the potential for "take" of delta smelt during project construction. The greatest potential for take would occur during impact pile driving, which would generate underwater noise levels that are predicted to reach levels that can cause harassment, injury, and mortality of fish, and during the installation and dewatering of cofferdams to construct Piers 2 and 5, which could entrap individuals and result in mortality. In addition, temporary delays in movement or cessation of spawning activity may occur in response to increased turbidity, suspended sediment, or underwater noise. Any behavioral effects, however, would be temporary and are not expected to measurably affect growth, survival, or reproductive success. To minimize direct and indirect effects, the project proponents will implement avoidance and minimization measures described in Section 4.3.1.3 prior to and during construction, and will compensate for temporary effects on, and loss of habitat for, delta smelt as described under Section 4.3.1.5. With implementation of measures and proposed compensation, the project is not expected to reduce appreciably the survival and recovery of delta smelt in the Sacramento River or region.

5.2.3 Delta Smelt Critical Habitat

The project *is likely to adversely affect* delta smelt designated critical habitat. Although the BSA is not designated as critical habitat for delta smelt (designated critical habitat includes the Sacramento River as far upstream as the current I Street Bridge), project effects may extend far enough downstream to affect delta smelt critical habitat. Project effects with potential to affect designated critical habitat for delta smelt include temporary effects on the water column (underwater noise and sound pressure, and water quality impacts). These impacts would be the same as those described earlier in the "Sacramento River Winter-Run Chinook Salmon" impacts section); however, no long-term effects on the PCEs or conservation value of delta smelt critical habitat in the region would be expected.

Chapter 6 References

6.1 Printed References

Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken (eds.). 2012. The Jepson Manual: Vascular Plants of California, second edition, revised. Berkeley: University of California Press.

Barr, C. B. 1991. The Distribution, Habitat, and Status of the Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus*. U.S. Fish and Wildlife Service. Sacramento, CA.

Baxter, R., R. Breuer, L. Brown, L. Conrad, F. Feyrer, S. Fong, K. Gehrts, L. Grimaldo, B. Herbold, P. Hrodey, A. Mueller-Solgar, T. Sommer, and K. Souza. 2010. *Interagency Ecological Program 2010 Pelagic Organism Decline Work Plan and Synthesis of Results*. Available: <www.water.ca.gov/iep/docs/FinalPOD2010Workplan12610.pdf>.

Bennett, W. A. 2005. Critical Assessment of the Delta Smelt Population in the San Francisco Estuary, California. *San Francisco Estuary and Watershed Science* [online serial] 3(2), Article 1.

Bisson, P. B. and R. E Bilby. 1982. Avoidance of suspended sediment by juvenile coho salmon. North American Journal of Fisheries Management. 2: 371-374.

California Department of Fish and Game. 2008. *California Aquatic Invasive Species Management Plan*. January 2008. Available: <http://www.dfg.ca.gov/invasives/plan/>. Accessed: February 11, 2014.

California Department of Fish and Wildlife. 2015. California Natural Diversity Database, RareFind 5, April 7, 2015. Search of the Sacramento West, Clarksburg, Saxon, Rio Linda, Sacramento East, Florin, Taylor Monument, Grays Bend, and Davis USGS 7.5-minute Quadrangles. Sacramento, CA.

California Department of Transportation. 2009. Final: technical guidance for assessment and mitigation of the hydroacoustic effects of pile driving on fish. February. Prepared by ICF Jones & Stokes and Illingworth and Rodkin, Inc. Sacramento, CA.

California Department of Water Resources. 2012. Urban Levee Design Criteria. May 2012. Available: http://www.water.ca.gov/floodsafe/leveedesign/ULDC_May2012.pdf. Accessed: February 16, 2015.

California Invasive Plant Council. 2006. California Invasive Plant Inventory. February. (Cal-IPC Publication 2006-02.) Berkeley, CA. Available: <http://www.cal-ipc.org/ip/inventory/pdf/Inventory2006.pdf>.

———. 2007. New weeds added to Cal-IPC inventory. Cal-IPC News 15(1/2):10. Available: <http://www.cal-ipc.org/ip/inventory/pdf/WebUpdate2007.pdf>.

Carlson, T. J., M. Hastings, and A. N. Popper. 2007. Update on recommendations for revised interim sound exposure criteria for fish during pile driving activities. Memorandum to Suzanne Theiss (California Department of Transportation) and Paul Wagner (Washington Department of Transportation).

Center for Biological Diversity, The Bay Institute, Natural Resources Defense Council. 2006. Emergency petition to list the delta smelt (*Hypomesus transpacificus*) as an endangered species under the endangered species Act. Submitted to the U.S. Fish and Wildlife Service, Washington DC and Sacramento Field Office, CA. March 8, 2006. Available: <http://www.biologicaldiversity.org/swcbd/species/deltasmelt/DS-Endangered-Petition-3-8-06.pdf>.

Central Valley Regional Water Quality Control Board. 2011. *The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region.* Fourth Edition, Revised October 2011 (with approved amendments). Available: <www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr.pdf>.

Environmental Laboratory 1987. U.S. Army Corps of Engineers Wetlands Delineation Manual. (Technical Report Y-87-1.) Vicksburg, MS: U.S. Army Waterways Experiment Station.

GEI Consultants, Inc. 2014. Preliminary Geotechnical and Foundation Report, I Street Bridge Replacement, Sacramento, California. Prepared for Mark Thomas and Company. Sacramento, CA.

ICF. 2015. Water Quality Assessment Report, I Street Bridge Replacement Project. Prepared for California Department of Transportation. August

ICF Jones and Stokes and Illingworth and Rodkin Inc. 2009. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish—Final. Prepared for California Department of Transportation: 298.

Kimmerer, W. J. 2002. Physical, Biological, and Management Responses to Variable Freshwater Flow into the San Francisco Estuary. *Estuaries* 25(6B): 1275–1290.

Lloyd, D. S., J. P. Koenings, and J. D. La Perriere. 1987. Effects of turbidity in fresh waters of Alaska. *North American Journal of Fisheries Management*.

Merz, J. E., S. Hamilton, P. S. Bergman, and B. Cavallo. 2011. Spatial perspective for delta smelt: a summary of contemporary survey data. *California Fish and Game* 97(4):164–189.

Moyle, P. 2002. Inland Fishes of California. Berkeley: University of California Press.

National Marine Fisheries Service 2009. Biological Opinion for the Dumbarton Bridge Seismic Retorfit Project. Southwest Regiona, Long Beach, CA. 2009/02486.

Natural Resources Conservation Service. 2003. California State-Listed Noxious Weeds. Available: http://plants.usda.gov/java/noxious?rptType=State&sort=sciname&statefips=06. Accessed: May 26, 2015.

_____. 2014a. United States Department of Agriculture, Soil Survey Staff. Web Soil Survey. Available: http://websoilsurvey.nrcs.usda.gov/. Accessed April 7, 2015. Last updated: September 20, 2014 (Sacramento County) and September 25, 2014 (Yolo County).

———. 2014b. United States Department of Agriculture. Federal Noxious Weed List. Available: http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/weedlist.pdf. Accessed: May 26, 2015. Last Updated: October 30, 2014.

Nobriga, M. L., T. R. Sommer, F. Feyrer, and D. Fleming. 2008. Long-Term Trends in Summertime Habitat Suitability for Delta Smelt (*Hypomesus transpacificus*). *San Francisco Estuary and Watershed Science* 6(1):1–13.

Popper, A. N., T. J. Carlson, A. D. Hawkins, B. L. Southall, and R. L. Gentry. 2006. Interim criteria for injury of fish exposed to pile driving operations: A white paper.

Popper, A. N. and M. C. Hastings. 2009. The effects of human-generated sound on fish. Integrative Zoology 4:43-52.

Sigler, J. W., T. C. Bjornn, and F. H. Everest. 1984. Effects of chronic turbidity on densities and growth of steelheads and coho salmon. Transactions of the American Fisheries Society 113: 142-150.

Sommer, T., C. Armor, R. Baxter, R. Breuer, L. Brown, M. Chotkowski, S. Culberson, F. Feyrer, M. Gingras, B. Herbold, W. Kimmerer, A. Mueller-Solger, M. Nobriga, and K. Souza. 2007. The Collapse of Pelagic Fishes in the Upper San Francisco Estuary. *Fisheries* 32(6):270–277.

Sommer, T., F. Mejia, M. Nobriga, F. Feyrer, and L. Grimaldo. 2011. The Spawning Migration of Delta Smelt in the Upper San Francisco Estuary. *San Francisco Estuary and Watershed Science* 9(2):1–16.

State Water Resources Control Board (SWRCB). 2011. 2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report) — Statewide. Available: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml. Accessed: April 10, 2015.Stebbins, R. C. 2003. Western reptiles and amphibians, Third Edition. New York, NY: Houghton Mifflin Company.

Stillwater Sciences. 2006. Napa River Fisheries Monitoring Program. Contract # DACW05-01-C-0015. Final report. Prepared by Stillwater Sciences, Davis, California for U.S. Army Corps of Engineers, Sacramento California.

Tabor, R.A., G.S. Brown, and V.T. Luiting. 2001. The Effect of Light Intensity on Sockeye Salmon Fry Migratory Behavior and Predation by Cottids in the Cedar River, Washington. North American Journal of Fisheries Management 24: 128–145.

Talley, T. S., D. Wright, and M. Holyoak. 2006a. Assistance with the 5-Year Review of the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*). U.S. Fish and Wildlife Service. Sacramento, CA.

Talley, S. T., M. Holyoak, and D. A. Piechink. 2006b. The effects of dust on the federally threatened valley elderberry longhorn beetle. Environmental Management 37: 647-658.

The Bay Institute, Natural Resources Defense Council, and Center for Biological Diversity. 2007. Petition to the State of California Fish and Game Commission and Supporting Information for Listing the Delta Smelt (*Hypomesus transpacificus*) as an Endangered Species under the California Endangered Species Act. Available: <http://www.biologicaldiversity.org/swcbd/SPECIES/deltasmelt/ds-state-endangered-petition-02-07-2007.pdf>.

Tuvikene, A. 1995. Responses of Fish to Polycyclic Aromatic Hydrocarbons (PAHs). *Annales Zoologici Fennici* 32:295–309.

U.S. Army Corps of Engineers. 2008. Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region (Version 2.0). ed. J. S. Wakeley, R. W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

———. 2014. Engineering Technical Letter 1110-2-583. *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures*. April 30, 2014. Washington, DC. Available: <http://www.publications.usace.army.mil/Portals/76/Publications/EngineerTechnicalLetters/ETL_1110-2-583.pdf>. Accessed: August 28, 2014.

U.S. Environmental Protection Agency. 2015. Surf Your Watershed, Lower Sacramento Watershed--18020109. Available: http://cfpub.epa.gov/surf/huc.cfm?huc_code=18020109. Last updated: 5-13-15. Accessed: 5-13-15.

U.S. Fish and Wildlife Service. 1996. Recovery plan for the Sacramento-San Joaquin Delta native fishes. Technical/Agency Draft. Prepared by Delta Native Fishes Recovery Team, U.S. Fish and Wildlife Service, Region 1, Portland, Oregon.

———.1999. *Conservation Guidelines for the Valley Elderberry Longhorn Beetle*. July 9.

———. 2002. Recovery Plan for the California Red-legged Frog (Rana aurora draytonii). U.S. Fish and Wildlife Service, Portland, Oregon. viii + 173 pp

———. 2004. Impacts of riprapping to aquatic organisms and river functioning, lower Sacramento River, California. Sacramento, CA. June 2004.

———. 2006. Endangered species Section 7 consultation for the U.S. Army Corps of Engineers' proposed Sacramento River bank protection project, 14 critical erosion sites along the Sacramento and Steamboat Slough, California. 1-1-07-F-0060. December.

———. 2015a. List of federal endangered and threatened species that occur in or may be affected by projects in the proposed project location. April 17, 2015.

———. 2015b. Delta juvenile fish monitoring program data. Available: <http://www.fws.gov/lodi/jfmp/>. Accessed: June 1, 2015.

———. 2015c. Guidance to Ensure Consistent and Effective Application of the U.S. Fish and Wildlife Service Mitigation Policy. Available at: <http://www.fws.gov/policy/501fw2.html>. Accessed: June 26, 2015.

———. 2016. List of federal endangered and threatened species that occur in or may be affected by projects in the proposed project location. January 27, 2016.

U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998. Engangered species act consultation handbook: procedures for conducting Section 7 consultations and conferences. March. Washington, D.C.

Wakeham, S. G., C. Schaffner, and W. Giger. 1980. Polycylic Aromatic Hydrocarbons in Recent Lake Sediments—I. Compounds Having Anthropogenic Origins. *Geochimica et Cosmochimica Acta*, 44 (3): 403–413.

Wang, J. C. S. 1986. Fishes of the Sacramento-San Joaquin estuary and adjacent waters, California: a guide to the early life histories. Technical Report 9. Prepared for the Interagency Ecological Study Program for the Sacramento-San Joaquin Estuary by California Department of Water Resources, California Department of Fish and Game, U.S. Bureau of Reclamation and U.S. Fish and Wildlife Service.

———. 1991. Early life stages and early life history of the delta smelt, Hypomesus transpacificus, in the Sacramento-San Joaquin Estuary, with comparison of early life stages of the longfin smelt, Spirinchus thaleichthys. Technical Report 28. Interagency Ecological Studies Program for the Sacramento-San Joaquin Estuary.

Wang, J. C. S., and R. L. Brown. 1993. Observations of early life stages of Delta smelt, Hypomesus transpacificus, in the Sacramento–San Joaquin Estuary in 1991, with a review of its ecological status in 1988 to 1990. Technical Report 35. November.

Waters, T. F. 1995. Sediment in streams—sources, biological effects and control. American Fisheries Society Monograph 7. Bethesda, MD. 251 pp.

Western Regional Climate Center. 2005. Temperature and Precipitation Records for SACRAMENTO WSO CITY (047633), California, 1890–2005. Available: < http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?casacc+nca >. Accessed: January 15, 2016.

6.2 Personal Communications

Rea, Maria. Assistant Regional Administrator, National Marine Fisheries Service. August 20, 2015—Letter to Ms. Sue Bauer, California Department of Transportation, regarding request for technical assistance for Caltrans' proposed project to replace the I-Street Bridge over the Sacramento River.

Appendix A Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
FEDERAL BUILDING, 2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
PHONE: (916)414-6600 FAX: (916)414-6713

Consultation Code: 08ESMF00-2015-SLI-0340 April 17, 2015
Event Code: 08ESMF00-2015-E-01724
Project Name: I Street Bridge Replacement

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2)

of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

The table below outlines lead FWS field offices by county and land ownership/project type. Please refer to this table when you are ready to coordinate (including requests for section 7 consultation) with the field office corresponding to your project, and send any documentation regarding your project to that corresponding office. Therefore, the lead FWS field office may not be the office listed above in the letterhead. Please visit our office's website (http://www.fws.gov/sacramento) to view a map of office jurisdictions.

Lead FWS offices by County and Ownership/Program

County	Ownership/Program	Species	Office Lead*
Alameda	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Alameda	All ownerships but tidal/estuarine	All	SFWO
Alpine	Humboldt Toiyabe National Forest	All	RFWO
Alpine	Lake Tahoe Basin Management Unit	All	RFWO
Alpine	Stanislaus National Forest	All	SFWO
Alpine	El Dorado National Forest	All	SFWO
Colusa	Mendocino National Forest	All	AFWO
Colusa	Other	All	By jurisdiction (see map)
Contra Costa	Legal Delta (Excluding ECCHCP)	All	BDFWO
Contra Costa	Antioch Dunes NWR	All	BDFWO
Contra Costa	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Contra Costa	All ownerships but tidal/estuarine	All	SFWO

El Dorado	El Dorado National Forest	All	SFWO
El Dorado	LakeTahoe Basin Management Unit		RFWO
Glenn	Mendocino National Forest	All	AFWO
Glenn	Other	All	By jurisdiction (see map)
Lake	Mendocino National Forest	All	AFWO
Lake	Other	All	By jurisdiction (see map)
Lassen	Modoc National Forest	All	KFWO
Lassen	Lassen National Forest	All	SFWO
Lassen	Toiyabe National Forest	All	RFWO
Lassen	BLM Surprise and Eagle Lake Resource Areas	All	RFWO
Lassen	BLM Alturas Resource Area	All	KFWO
Lassen	Lassen Volcanic National Park	All (includes Eagle Lake trout on all ownerships)	SFWO
Lassen	All other ownerships	All	By jurisdiction (see map)

Marin	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Marin	All ownerships but tidal/estuarine	All	SFWO
Mendocino	Russian River watershed	All	SFWO
Mendocino	All except Russian River watershed	All	AFWO
Napa	All ownerships but tidal/estuarine	All	SFWO
Napa	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Nevada	Humboldt Toiyabe National Forest	All	RFWO
Nevada	All other ownerships	All	By jurisdiction (See map)
Placer	Lake Tahoe Basin Management Unit	All	RFWO
Placer	All other ownerships	All	SFWO
Sacramento	Legal Delta	Delta Smelt	BDFWO
Sacramento	Other	All	By jurisdiction (see map)
San Francisco	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO

San Francisco	All ownerships but tidal/estuarine	All	SFWO
San Mateo	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO
San Mateo	All ownerships but tidal/estuarine	All	SFWO
San Joaquin	Legal Delta excluding San Joaquin HCP	All	BDFWO
San Joaquin	Other	All	SFWO
Santa Clara	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO
Santa Clara	All ownerships but tidal/estuarine	All	SFWO
Shasta	Shasta Trinity National Forest except Hat Creek Ranger District (administered by Lassen National Forest)	All	YFWO
Shasta	Hat Creek Ranger District	All	SFWO
Shasta	Bureau of Reclamation (Central Valley Project)	All	BDFWO
Shasta	Whiskeytown National Recreation Area	All	YFWO
Shasta	BLM Alturas Resource Area	All	KFWO

Shasta	Caltrans	By jurisdiction	SFWO/AFWO
Shasta	Ahjumawi Lava Springs State Park	Shasta crayfish	SFWO
Shasta	All other ownerships	All	By jurisdiction (see map)
Shasta	Natural Resource Damage Assessment, all lands	All	SFWO/BDFWO
Sierra	Humboldt Toiyabe National Forest	All	RFWO
Sierra	All other ownerships	All	SFWO
Solano	Suisun Marsh	All	BDFWO
Solano	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Solano	All ownerships but tidal/estuarine	All	SFWO
Solano	Other	All	By jurisdiction (see map)
Sonoma	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Sonoma	All ownerships but tidal/estuarine	All	SFWO
Tehama	Mendocino National Forest	All	AFWO
	Shasta Trinity National Forest		

Tehama	except Hat Creek Ranger District (administered by Lassen National Forest)	All	YFWO
Tehama	All other ownerships	All	By jurisdiction (see map)
Yolo	Yolo Bypass	All	BDFWO
Yolo	Other	All	By jurisdiction (see map)
All	FERC-ESA	All	By jurisdiction (see map)
All	FERC-ESA	Shasta crayfish	SFWO
All	FERC-Relicensing (non-ESA)	All	BDFWO
***Office Leads:**			
AFWO=Arcata Fish and Wildlife Office			
BDFWO=Bay Delta Fish and Wildlife Office			
KFWO=Klamath Falls Fish and Wildlife Office			
RFWO=Reno Fish and Wildlife Office			
YFWO=Yreka Fish and Wildlife Office			

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: I Street Bridge Replacement

Official Species List

Provided by:

Sacramento Fish and Wildlife Office
FEDERAL BUILDING
2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
(916) 414-6600

Non-participating U.S. Fish and Wildlife Service office(s):

The following office(s) have jurisdictions that overlap your project area, but do not provide automatically generated Species list documents. Please contact them directly to request a Species list document. Do this by visiting their website, if it is provided below. If a website is not provided, contact the office(s) by mail or phone.

San Francisco Bay-Delta Fish and Wildlife
650 CAPITOL MALL
SUITE 8-300
SACRAMENTO, CA 95814
(916) 930-5603

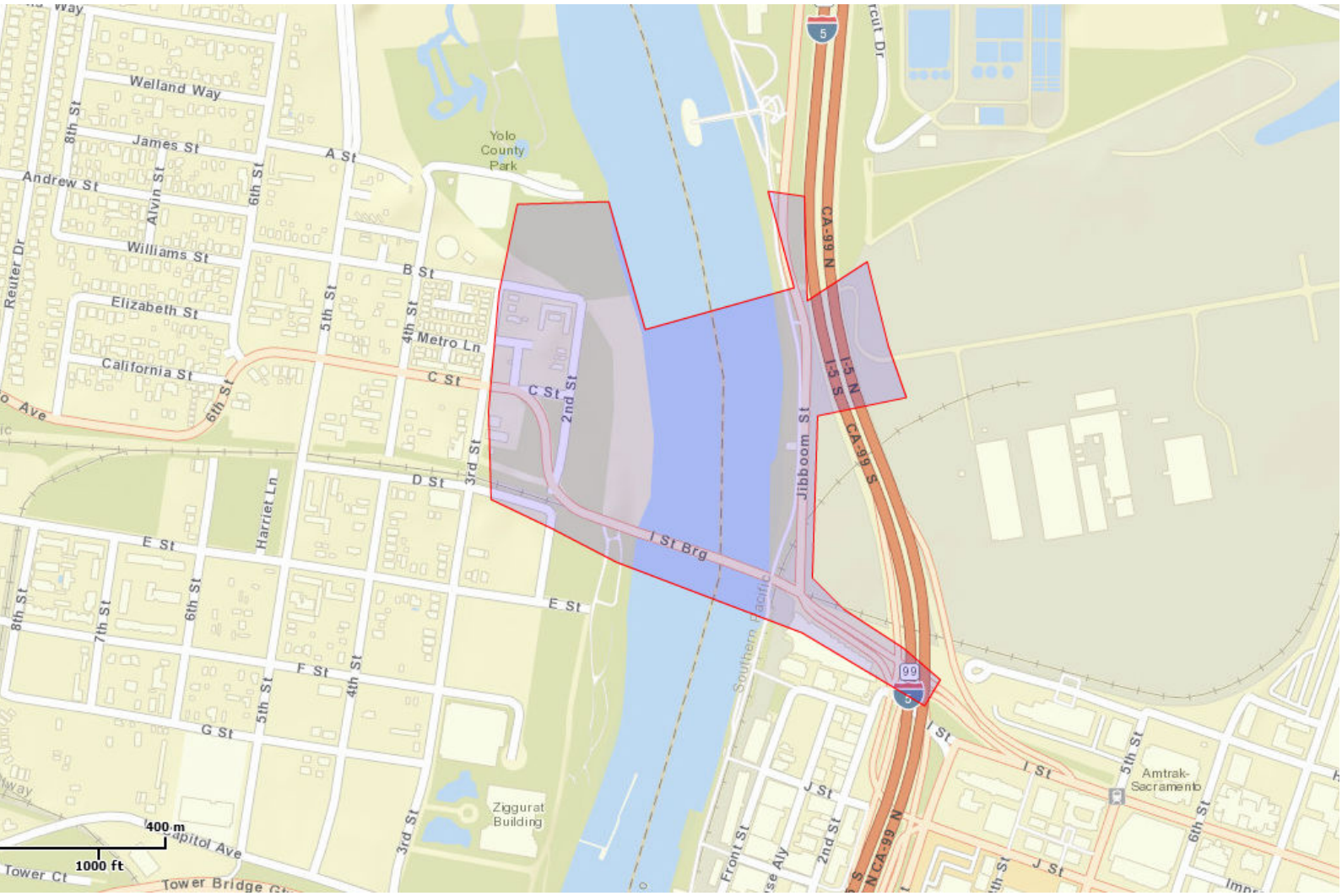
Consultation Code: 08ESMF00-2015-SLI-0340
Event Code: 08ESMF00-2015-E-01724

Project Type: Bridge Construction / Maintenance

Project Name: I Street Bridge Replacement
Project Description: Construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge and south of Richards Boulevard.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-121.5027735 38.5843329, -121.5047883 38.5852705, -121.5078353 38.5861763, -121.5098974 38.5869831, -121.5099403 38.5881236, -121.5097687 38.5896331, -121.5094683 38.5907719, -121.5079662 38.5908071, -121.5073654 38.5891635, -121.5049192 38.5897002, -121.5053484 38.5909396, -121.5047476 38.5908725, -121.5047047 38.5895308, -121.5037176 38.5900339, -121.5033743 38.5889605, -121.5030739 38.5882896, -121.504533 38.5880548, -121.5046188 38.585975, -121.5041038 38.5855725, -121.5031168 38.5850693, -121.502516 38.5846667, -121.5027735 38.5843329)))

Project Counties: Sacramento, CA | Yolo, CA

Endangered Species Act Species List

There are a total of 8 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Amphibians	**Status**	**Has Critical Habitat**	**Condition(s)**
California Tiger Salamander *(Ambystoma californiense)* Population: U.S.A. (CA - Sonoma County)	Endangered	Final designated	
California red-legged frog *(Rana draytonii)* Population: Entire	Threatened	Final designated	
Crustaceans			
Vernal Pool fairy shrimp *(Branchinecta lynchi)* Population: Entire	Threatened	Final designated	
Vernal Pool tadpole shrimp *(Lepidurus packardi)* Population: Entire	Endangered	Final designated	
Fishes			
Delta smelt *(Hypomesus transpacificus)* Population: Entire	Threatened	Final designated	
steelhead *(Oncorhynchus (=salmo)*	Threatened	Final designated	

mykiss) Population: Northern California DPS			
Insects			
Valley Elderberry Longhorn beetle *(Desmocerus californicus dimorphus)* Population: Entire	Threatened	Final designated	
Reptiles			
Giant Garter snake *(Thamnophis gigas)* Population: Entire	Threatened		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
FEDERAL BUILDING, 2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
PHONE: (916)414-6600 FAX: (916)414-6713

Consultation Code: 08ESMF00-2015-SLI-0340 January 27, 2016
Event Code: 08ESMF00-2016-E-01499
Project Name: I Street Bridge Replacement -- created on April 17, 2015 11:24

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2)

of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

Official Species List

Provided by:

Sacramento Fish and Wildlife Office
FEDERAL BUILDING
2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
(916) 414-6600

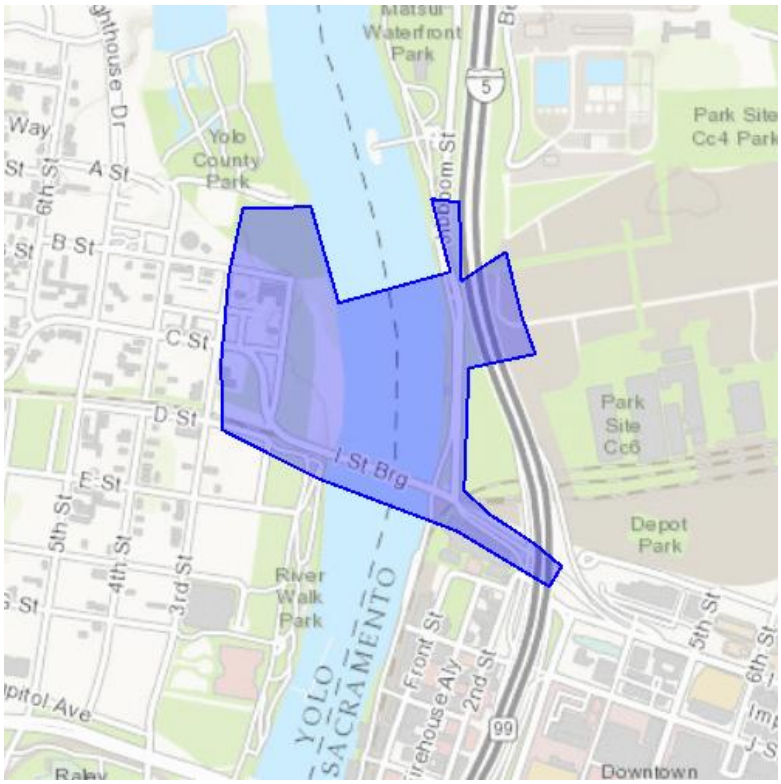
Consultation Code: 08ESMF00-2015-SLI-0340
Event Code: 08ESMF00-2016-E-01499

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Name: I Street Bridge Replacement -- created on April 17, 2015 11:24
Project Description: Construct a new public crossing of the Sacramento River north of the Union Pacific Railroad-owned I Street Bridge and south of Richards Boulevard.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-121.5027735 38.5843329, -121.5047883 38.5852705, -121.5078353 38.5861763, -121.5098974 38.5869831, -121.5099403 38.5881236, -121.5097687 38.5896331, -121.5094683 38.5907719, -121.5079662 38.5908071, -121.5073654 38.5891635, -121.5049192 38.5897002, -121.5053484 38.5909396, -121.5047476 38.5908725, -121.5047047 38.5895308, -121.5037176 38.5900339, -121.5033743 38.5889605, -121.5030739 38.5882896, -121.504533 38.5880548, -121.5046188 38.585975, -121.5041038 38.5855725, -121.5031168 38.5850693, -121.502516 38.5846667, -121.5027735 38.5843329)))

Project Counties: Sacramento, CA | Yolo, CA

Endangered Species Act Species List

There are a total of 9 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Amphibians	**Status**	**Has Critical Habitat**	**Condition(s)**
California red-legged frog *(Rana draytonii)* Population: Entire	Threatened	Final designated	
California tiger Salamander *(Ambystoma californiense)* Population: U.S.A. (Central CA DPS)	Threatened	Final designated	
Birds			
Least Bell's vireo *(Vireo bellii pusillus)* Population: Entire	Endangered	Final designated	
Crustaceans			
Vernal Pool fairy shrimp *(Branchinecta lynchi)* Population: Entire	Threatened	Final designated	
Vernal Pool tadpole shrimp *(Lepidurus packardi)* Population: Entire	Endangered	Final designated	
Fishes			

Delta smelt *(Hypomesus transpacificus)* Population: Entire	Threatened	Final designated	
steelhead *(Oncorhynchus (=salmo) mykiss)* Population: Northern California DPS	Threatened	Final designated	
Insects			
Valley Elderberry Longhorn beetle *(Desmocerus californicus dimorphus)* Population: Entire	Threatened	Final designated	
Reptiles			
Giant Garter snake *(Thamnophis gigas)* Population: Entire	Threatened		

Critical habitats that lie within your project area

The following critical habitats lie fully or partially within your project area.

Fishes	Critical Habitat Type
Delta smelt *(Hypomesus transpacificus)* Population: Entire	Final designated

Appendix B Delineation of Waters of the United States for the I Street Bridge Replacement Project

May 3, 2016

Mr. Marc Fugler
U.S. Army Corps of Engineers
Sacramento District, Regulatory Division
1325 J Street, Room 1350
Sacramento, California 95814-2922

Subject: Request for preliminary jurisdictional determination of the delineation of the proposed I Street Bridge Project, Sacramento County and Yolo County, California

Dear Mr. Fugler:

On behalf of the City of Sacramento and the City of West Sacramento (Cities), ICF International is submitting a Request for Preliminary Jurisdictional Determination (PJD) for the Sacramento River at I Street Bridge project. The City of Sacramento, in cooperation with the City of West Sacramento and the California Department of Transportation, proposes to construct a new bridge over the Sacramento River to replace the existing vehicle crossing that is currently accommodated by the existing I Street Bridge in order to remove a series of functionally obsolete or structurally deficient bridges (i.e., approach structures). The new connection would also reduce future traffic congestion, improve operations and safety, serve multiple modes of transportation, and comply with current American Association of State Highway and Transportation Officials, Caltrans, and local agency design standards.

The Cities plan to submit a permit application for any work below OHWM or in the potential wetland. At this time, the Cities are requesting a PJD of the OHWM of the Sacramento River and the boundary of the potential wetland based on the discussion provided below and the attached delineation map (Exhibit A), photographs, and data forms.

Delineation Area

The delineation area comprises approximately 42 acres surrounding the proposed bridge and approaches (Exhibit A). The proposed bridge site is located over the Sacramento River between the Cities of Sacramento and West Sacramento, approximately 1,000 feet north of the existing I Street Bridge (Figure 1). The delineation area consists of the Sacramento River, riparian woodland, and open space with bike/pedestrian trails along the Sacramento River, local roads, elevated road (viaduct) and bridge approach structures, residential areas, and commercial

development. The delineation area has a relatively high level of historical and ongoing disturbance. Elevations in the delineation area range from -6 to 64 feet above mean sea level.

According to soil data from the Natural Resources Conservation Service, the delineation area contains the following five soil map units and water:

- Orthents-Urban land complex, 0 to 2 percent slopes (Sacramento County)
- Urban land (Sacramento County)
- Lang sandy loam (Yolo County)
- Lang sandy loam, deep (Yolo County)
- Sycamore silt loam (Yolo County)

Of these, Sycamore soils are hydric and inclusions within the map units of Orthents-Urban land and Lang sandy loam are hydric. The soil profile has been disturbed by development in West Sacramento and construction activity in the Sacramento Railyards Specific Plan area.

Methods

ICF wetland ecologist/botanist Lisa Webber conducted the field study on April 8, 2015 on behalf of the Cities in support of the proposed I Street Bridge project. The field study included investigations to identify areas that could be subject to jurisdiction by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA) and the California Department of Fish and Wildlife (DFW) and to evaluate possible environmental constraints. The investigation consisted of walking through the delineation area, mapping the observed OHWM where accessible with a sub-meter accuracy global positioning system (GPS) unit, sampling potential wetland areas using the routine on-site determination method described in the 1987 *Corps of Engineers Wetlands Delineation Manual*, and implementing the supplemental procedures and wetland indicators described in the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Arid West Region*. The wetland ecologist/botanist identified the OHWM of the Sacramento River in the field using the guidance provided in Regulatory Guidance Letter 05-05. This boundary was confirmed using site-specific topographic mapping to identify the location of the 19-foot elevation, which has been identified as the OHWM for the Sacramento River at the existing I Street bridge. Aerial and ground-view photographs of the study area were reviewed prior to the field study.

A total of four data points were examined in the delineation area—two data points to establish the riparian wetland boundary (DP-1w and DP-2u) and two data points to record upland conditions (DP-3u and DP-4u). The data forms are attached.

Results

The delineation area in the City of Sacramento east of the levee is developed, graded, or landscaped. The delineation area in the City of West Sacramento west of the levee includes residences and other buildings with landscaping, as well as ruderal woodland, which supports few native trees and predominantly tree of heaven (*Ailanthus altissima*) [FACU]. One other waters (the Sacramento River) and one potential wetland were identified in the delineation area. These features are further described below.

Other Waters—Sacramento River

The location of the OHWM in the Sacramento River was based on the elevation of 19 feet NGVD that was previously determined by the USACE at the I Street Bridge. Observations in the field further confirmed this location based on the presence of shelving, silt deposition, and wracking. The average width of the Sacramento River at the OHWM is approximately 672 feet, and the delineation area encompasses 4.877 acres of the river (Photo 1). The channel bottom is a natural substrate, presumably sand and sediment, but water turbidity prevented visual confirmation of the composition. The river banks are mostly steeply sloped and support riparian forest vegetation, with riprap near the bottom of the slope.

The cottonwood riparian community on the Sacramento River banks is predominantly mature Fremont cottonwood (*Populus fremontii*) [FAC] trees associated with valley oak (*Quercus lobata*) [FACU] and black walnut (*Juglans californica* var. *hindsii*) [FAC]. Other riparian tree species observed include Oregon ash (*Fraxinus latifolia*) [FACW], boxelder (*Acer negundo* var. *californicum*) [FACW], and black willow (*Salix gooddingii*) [FACW]. The riparian understory on the waterside of the levee is primarily rip-rap with nonnative annual grasses and forbs, however, there are also patches of more typical riparian species, such as narrow-leaf willow (*Salix exigua*) [FACW], Himalayan blackberry (*Rubus armeniacus*) [FACU], and mugwort (*Artemisia douglasiana*) [FAC].

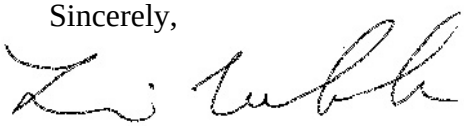
Riparian Wetland

A riparian forest/shrub wetland occurs in the delineation area within riparian habitat that meets all three federal wetland criteria (DP-1w). The riparian wetland is located in the northern portion of the delineation area on the east side of the Sacramento River within a basin (Photo 2). This basin appears to capture overflow from the Sacramento River during high flows. The vegetative composition of riparian forest/shrub wetlands is predominantly cottonwood, but also includes buttonwillow (*Cephalanthus occidentalis* var. *californicus*) [OBL], boxelder, and narrow-leaf willow. Hydric soils in the wetland met the redox depressions (F8) indicator. Wetland hydrology was indicated by observations of water marks (B1), sediment deposits (B2), and oxidized rhizospheres along living roots (C3).

The Cities request verification of the OHWM of the Sacramento River and the extent of the riparian wetland within the delineation area and a preliminary jurisdictional determination according to RGL 08-02. If you require additional information or have any questions regarding this request, please contact me at lisa.webber@icfi.com or Claire Bromund at claire.bromund@icfi.com or either of us by phone at (916) 737-3000.

Thank you for your assistance with this project.

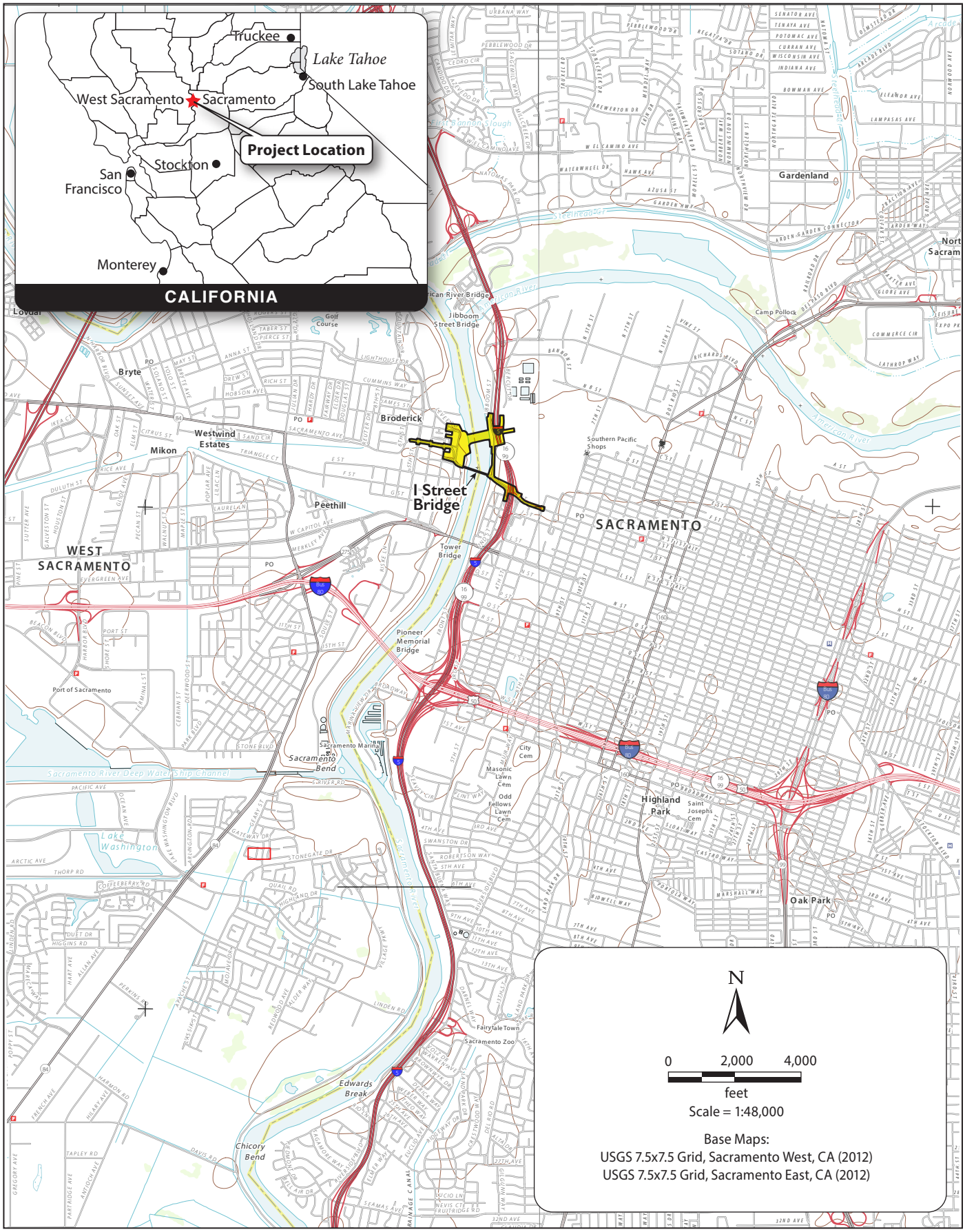
Sincerely,



Lisa Webber
Wetland Ecologist

Attachments:

- Figure 1
- Exhibit A
- Photographs
- Data Forms



Graphics ... 00203.14 (6/10/15) AB

Figure 1
Vicinity Map

121°30'30"W

121°30'20"W

121°30'10"W

38°35'20"N

DP-1w

DP-2u

DP-3u

DP-4u

Sacramento River

I Street Bridge Replacement Project
June 2015

Legend

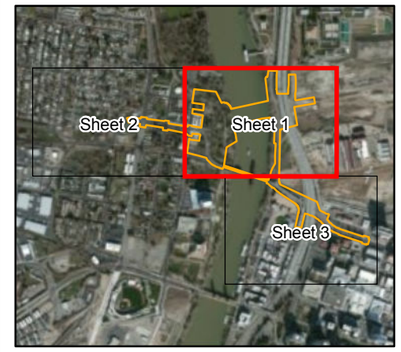
- Delineation Area (42 Acres)
- Data Points
- OHWM
- Temporary Detention Basin

Wetlands

- Riparian Forest/Shrub Wetland (0.249 Acre)

Other Waters

- Tidal Perennial Stream (4.877 Acres)



0 50 100 200
Feet

1 inch = 200 feet

Notes:
Base Map Source: ICFI 2015
Imagery Source: NAIP 2014
USGS Topo Quad: Sacramento West
PLSS: New Helvetia and Wetlands Landgrants

Prepared By: ICFI/ 916.737.3000
Delineated By: L. Webber
Delineation Date: April 9th, 2015
Drawn By: A. Angier

Path: K:\Projects_1\mark_thomas\002203_14_I_St_Bridge\mapdoc\BioWetland_Delineation_20150511.mxd, Author: , Date: 6/12/2015

Exhibit A
Delineation of Potential Waters of the United States, Including Wetlands

121°31'0"W

121°30'50"W

121°30'40"W

38°35'20"N

I Street Bridge Replacement Project
June 2015

Legend

- Delineation Area (42 Acres)
- Data Points
- OHWM
- Temporary Detention Basin

Wetlands

- Riparian Forest/Shrub Wetland (0.249 Acre)

Other Waters

- Tidal Perennial Stream (4.877 Acres)

0 50 100 200
Feet

1 inch = 200 feet

Notes:
Base Map Source: ICFI 2015
Imagery Source: NAIP 2014
USGS Topo Quad: Sacramento West
PLSS: New Helvetia and Wetlands Landgrants

Prepared By: ICFI/ 916.737.3000
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Path: K:\Projects_1\mark_thomas\00203_14_I_St_Bridge\mapdoc\BioWetland_Delineation_20150511.mxd; Author: ; Date: 6/12/2015

Exhibit A
Delineation of Potential Waters of the United States, Including Wetlands

I Street Bridge Replacement Project
June 2015

Legend

- Delineation Area (42 Acres)
- Data Points
- OHWM
- Temporary Detention Basin

Wetlands

- Riparian Forest/Shrub Wetland (0.249 Acre)

Other Waters

- Tidal Perennial Stream (4.877 Acres)

N

0 50 100 200
Feet

1 inch = 200 feet

Notes:
Base Map Source: ICFI 2015
Imagery Source: NAIP 2014
USGS Topo Quad: Sacramento West
PLSS: New Helvetia and Wetlands Landgrants

Prepared By: ICFI/ 916.737.3000
Delineated By: L. Webber
Delineation Date: April 9th, 2015
Drawn By: A. Angier

Path: K:\Projects_1\mark_thomas\00203_14_1_St_Bridge\mapdoc\Bio\Wetland_Delineation_20150511.mxd; Author: L. Webber; Date: 6/12/2015

Exhibit A
Delineation of Potential Waters of the United States, Including Wetlands

Photo 1. View of proposed I Street Bridge site, looking from West Sacramento toward Sacramento.

Photo 2. Riparian wetland, looking down from the top of the levee slope.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: I Street Bridge City/County: Sacramento/Sac. / West Sacramento/Yolo Sampling Date: 4-8-15

Applicant/Owner: City of Sacramento + City of West Sacramento State: CA Sampling Point: DP-1W

Investigator(s): Webber, Howe Section, Township, Range: T9N, R4E, unnamed section

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): <1%

Subregion (LRR): CLPR Lat: Long: Datum:

Soil Map Unit Name: La (Laug Sandy loam) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: Extreme drought year, but ~1.0" of rainfall in the previous 24 hours.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo	10	N	FACW
2. Cephalanthus occidentalis	30	Y	OBL
3. Populus fremontii	5	N	FAC
4.			
	45% = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 80 % Cover of Biotic Crust 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: DP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR4/2	80	10YR4/6	20	C	PL	SiCl	many roots

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none to 14"

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1) (**Nonriverine**)
- X Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): >14"

Water Table Present? Yes ___ No X Depth (inches): >14"

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >14"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area is in a basin that appears to capture overflow from the Sac. River

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: I Street Bridge City/County: Sacramento/Sac. West Sacramento/Yolo Sampling Date: 4-8-15

Applicant/Owner: City of Sacramento + City of West Sacramento State: CA Sampling Point: DP-24

Investigator(s): Webber, Howe Section, Township, Range: T9N, R4E, unnamed section

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 20

Subregion (LRR): CLRR Lat: Long: Datum:

Soil Map Unit Name: La (Lang Sandy loam) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks: Extreme drought year, but .1" of rainfall in the previous 24 hours.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus fremontii	15	Y	FAC
2.			
3.			
4.			
	15 = Total Cover		
Sapling/Shrub Stratum (Plot size: 20')			
1. Rubus armeniacus	50%	Y	FACU
2.			
3.			
4.			
5.			
	50% = Total Cover		
Herb Stratum (Plot size: 5')			
1. Oxalis pes-caprae	5	N	UPL
2. Galium aparine	20	Y	FACU
3. Hordeum murinum	55	Y	FACU
4. Bromus diandrus	2	N	UPL
5. Bromus tectorum	2	N	UPL
6. Avena fatua	6	N	UPL
7.			
8.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: VP-2 u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					L	wood chunks + some charcoal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock

Depth (inches): 10"

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): >10"

Water Table Present? Yes ____ No X Depth (inches): >10"

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): >10"

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Site on slope above wetland basin.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: I Street Bridge City/County: Sacramento/Sac. West Sacramento/Yolo Sampling Date: 4-8-15

Applicant/Owner: City of Sacramento & City of West Sacramento State: CA Sampling Point: DP-34

Investigator(s): Webber, Howe Section, Township, Range: T9N, R4E, unnamed section

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): slightly concave Slope (%): <1%

Subregion (LRR): CLRR Lat: Long: Datum:

Soil Map Unit Name: On boundary of La (Langsandyloam) & So (Sycamore silt loam) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No ____
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Extreme drought year, but ~1" of rainfall in the previous 24 hours.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Hordeum murinum	30	y	FACU
2. Brassica sp.	20	y	UPL
3. Matricaria discoidea	10	n	FACU
4. Medicago polymorpha	15	y	FACU
5. Geranium dissectum	10	n	UPL
6.			
7.			
8.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 15% % Cover of Biotic Crust Ø

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: Ø (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: Ø (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: UP-3y

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 4/3	100					FSL	
6-9	2.5Y 4/3	80	7.5YR 2.5/1	20	C	PL	scl	
9-12	2.5Y 5/2	100%					C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: clay layer

Depth (inches): 12"

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): >12"

Water Table Present? Yes ___ No X Depth (inches): >12"

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >12"

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators, no surface water despite recent rain.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: I Street Bridge City/County: Sacramento/Sac. West Sacramento/Yolo Sampling Date: 4-8-15

Applicant/Owner: City of Sacramento & City of West Sacramento State: CA Sampling Point: DP-4

Investigator(s): Webber, Howe Section, Township, Range: T9N, R4E, unnamed section

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): CLRR Lat: Long: Datum:

Soil Map Unit Name: 186 (Orthents-Urban land complex, 0-2% slopes) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Extreme drought year, but ~1" of rainfall in the previous 24 hours. Located in railyard construction area.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Polypogon monspeliensis	5	N	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 95% % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	____	x 1 =	____
FACW species	____	x 2 =	____
FAC species	____	x 3 =	____
FACU species	____	x 4 =	____
UPL species	____	x 5 =	____
Column Totals:	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Veg is sparse. Located in a disturbed construction area with fire tracks.

SOIL

Sampling Point: DP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/2	100					Sil	gravel / fill

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock / fill

Depth (inches): 3-4

Hydric Soil Present? Yes ____ No X

Remarks: Site is in Sec. railyard construction area

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 2"

Water Table Present? Yes X No ____ Depth (inches): to surface

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): to surface

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology is temporary, due to construction activity and grading. Current surface water is due to recent rain.

Appendix C Representative Photographs

Appendix C Representative Photographs

Photo 1. Sacramento River and riparian habitat, looking east

Photo 2. Sacramento River and riparian habitat, looking west

Photo 3. Riparian forest/shrub wetland

Photo 4. Riparian forest/shrub wetland

Photo 5. Ruderal woodland west of bridge ramp

Photo 6. Ruderal woodland on north side of C Street

Photo 7. Ruderal woodland east of bridge ramp

Photo 8. Landscaped at edge of Bercut Drive

Photo 9. Developed/Graded under I-5

Photo 10. Underside of Jibboom Street viaduct