

Greenbriar Development Project
Sacramento, California

Recirculated Draft Environmental Impact Report



State Clearinghouse Number 2005062144

Prepared for:

City of Sacramento
Environmental Planning Services

and

Sacramento Local Agency Formation Commission

November 2006



Recirculated Draft Environmental Impact Report



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November 2006



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ABBREVIATIONS AND ACRONYMS

AB	Assembly Bill
ALUC	Sacramento County Airport Land Use Commission
APEX	aircraft particle emissions experiment
AQAP	Air Quality Attainment Plan
ARB	California Air Resources Board
ATCM	Airborne Toxics Control Measure
Blueprint	Sacramento Region Blueprint: Transportation/Land Use Study
CAA	federal Clean Air Act
CAAA	federal Clean Air Act Amendments of 1990
CAAQS	California ambient air quality standards
CCAA	California Clean Air Act
City	City of Sacramento's
CLUP	Comprehensive Land Use Plan
CO	Carbon monoxide
diesel PM	PM from diesel-fueled engines
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FIP	Federal Implementation Plan
GE and Boeing	aviation industry
HAPs	hazardous air pollutants
HCP	Habitat Conservation Plan
HRA	health-risk assessment
I-5	Interstate 5
I-80	Interstate 80
Joint Vision	North Natomas Joint Vision
LAFCo	Sacramento Local Agency Formation Commission
lb/day	pounds per day
LEV	Low Emission Vehicle
MACT and BACT	maximum or best available control technology for toxics
MOU	Memorandum of Understanding
NAAQS	national ambient air quality standards
NASA	National Aeronautics and Space Administration
NESHAP	national emissions standards for HAPs
NNCP	North Natomas Community Plan
NO	nitric oxide
NO ₂	nitrogen dioxide
NOP	Notice of Preparation

NO _x	nitrogen oxides
OAP ozone	Ozone Attainment Plan photochemical smog
PAH	polycyclic aromatic hydrocarbons
PM ₁₀ and PM _{2.5}	respirable and fine particulate matter
ppm	parts per million
proposed project	Greenbriar development project
PUD	Planned Unit Development
RD 1000	Reclamation District Number 1000
RDEIR	Recirculated Draft Environmental Impact Report
REL	Reference Exposure Level
ROG	reactive organic gases
RT	Sacramento Regional Transit
SACOG	Sacramento Area Council of Governments
SCAQMD	South Coast Air Quality Management District
SIP	State Implementation Plan
SJVAPCD	San Joaquin Valley Air Pollution Control District
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO ₂	sulfur dioxide
SOI	Sphere of Influence
SPA	Special Planning Area
SR 70/99	State Route 70/99
SRCS D	Sacramento Regional County Sanitation District
SVAB	Sacramento Valley Air Basin
TACs	toxic air contaminants
T-BACT	best available control technology for TACs
TPY	tons per year
VMT	vehicle miles traveled
VOC	volatile organic compound

1 INTRODUCTION

1.1 BACKGROUND AND PURPOSE OF THE RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT

In July 2006, the City of Sacramento (City) and the Sacramento Local Agency Formation Commission (LAFCo) published the Greenbriar Development Project Draft Environmental Impact Report (DEIR), which assessed the potential environmental impacts of implementing the proposed Greenbriar development project. The proposed project would be a sphere-of-influence boundary change and annexation to the City of Sacramento of 577 acres; it would include development of 3,473 residential units, approximately 27.5 acres of commercial land uses, an approximately 39-acre lake/detention basin, a 10-acre elementary school, approximately 49 acres of parks and open space, and a 250-foot linear open space/buffer along the property's western boundary that would be managed as habitat for the giant garter snake.

The DEIR was circulated for public review and comment for a period of 45 days that ended on September 5, 2006. At the end of the review period, comments were received on the environmental impact report (EIR). The City and LAFCo reviewed those comments to identify specific environmental concerns and determine whether any additional environmental analysis would be required to respond to issues raised in the comments. Two issues were raised that resulted in the addition of significant new information to the EIR: new information related to the ability of local levees to protect the site from flooding during the 100-year flood event, and additional information relating to exposure of project residents to diesel particulate emissions from traffic on Interstate 5 and State Route 70/99.

Section 15088.5 of the California Environmental Quality Act Guidelines (State CEQA Guidelines) requires lead agencies to recirculate information in an EIR when significant new information is added to the EIR after public notice is given of the availability of the DEIR for review. Significant new information requiring recirculation includes a disclosure showing that "changes to the project or environmental setting" or "a new significant environmental impact would result from the project or from a new mitigation measure proposed to be implemented." Section 15088.5 requires recirculation of only the significant new information, rather than the entire DEIR. The proposed project would result in a new significant flooding impact, and the EIR now evaluates the project's air quality impacts based on a new threshold of significance pertaining to emissions exposure. Therefore, the City and LAFCo have decided to recirculate these sections of the DEIR for public review.

As required by Section 15088 of the State CEQA Guidelines, the City and LAFCo will evaluate and respond to all comments that have been received on the DEIR and new comments provided on the sections included in the recirculated DEIR (RDEIR). All comments and responses will be included in the final EIR (FEIR).

1.2 CONTENT OF THE RDEIR

Consistent with the requirements of Section 15088.5(c) of the State CEQA Guidelines, this RDEIR contains only those sections of the DEIR in which significant new information is provided (e.g., Hydrology, Drainage, and Water Quality; Air Quality). This information is considered significant new information based on Section 15088.5(a) of the State CEQA Guidelines; therefore, the City and LAFCo are providing this information to the public for its review as part of this RDEIR.

The RDEIR consists of the following chapters and sections. All chapter and section numbering is consistent with the chapter and section numbering outline in the DEIR (released July 2006). Changes to the DEIR text are identified by underline for additions and ~~strikeout~~ for deletions.

Chapter 1, "Introduction": Chapter 1 describes the purpose and organization of the RDEIR.

Chapter 3, “Project Description”: Chapter 3 describes the project location, background, proposed actions by the applicants, lead agency, trustee and responsible agency actions, project characteristics, and project objectives. This chapter also describes project construction and regulatory requirements. No changes to the project description have occurred since publication of the DEIR (July 2006).

Section 6.2, “Air Quality”: This section describes the project’s potential air quality impacts, including impacts from exposure to freeway emissions as related to a new significance threshold. Although this new threshold is added, it does not result in a new significant impact.

Section 6.10, “Hydrology, Drainage, and Water Quality”: This section describes the environmental impacts related to water quality during construction and operation of the project, drainage capacity, flooding at the project site resulting from levee or dam failure, and on-site flooding (i.e., surface runoff). This section identifies a new significant flooding impact. Mitigation is recommended for significant impacts where necessary and feasible.

Chapter 7, “Other CEQA-Mandated Sections”: This chapter provides an analysis of the project’s potential growth-inducing and cumulative impacts. The discussion of the project’s growth-inducing and cumulative impacts is the same as that circulated in the DEIR except for the discussion of hydrology impacts.

Chapter 8, “Comparative Merits of Alternatives to the Proposed Project”: This chapter describes alternatives to the project, at a level consistent with CEQA requirements (State CEQA Guidelines Section 15126.6[d]). This chapter presents a brief description of alternatives that could mitigate the project’s significant environmental impacts while meeting most project objectives. This chapter also describes the alternatives previously considered and rejected. The discussion of alternatives is the same as that circulated in the DEIR except for the discussion of hydrology impacts.

Chapter 9, “References”: This chapter sets forth a comprehensive listing of all sources of information used in the preparation of the RDEIR.

Chapter 10, “Report Preparation”: This chapter identifies the RDEIR authors and the consultants who provided analysis in support of the RDEIR’s conclusions.

Appendices: This section contains revised calculation of air quality mitigation fees.

1.3 RELATIONSHIP TO THE DEIR

Consistent with the requirements of Section 15087 of the State CEQA Guidelines, this RDEIR is being made available on November 14, 2006, for public review for a period of 45 days. The public-review period ends on January 2, 2007. During this period, the general public, agencies, and organizations may submit written comments on the RDEIR to the lead agencies (i.e., City of Sacramento and LAFCo). Pursuant to procedures set forth in Section 15088.5(f)(2) of the State CEQA Guidelines, reviewers are requested to limit their comments to the materials contained in this RDEIR.

As required under Sections 15087 and 15088.5(d) of the State CEQA Guidelines, the City and LAFCo have sent a notice of availability to all those who submitted comments on the DEIR, to all organizations and members of the public who were on the City’s distribution list for the DEIR, and to any additional persons or organizations that have requested information about the EIR since the publication of the DEIR.

Copies of this RDEIR are available for review at:

City of Sacramento
Development Services Department
901 I Street
Sacramento, CA 95814

Sacramento Local Agency Formation Commission
1112 I Street, Suite 100
Sacramento, CA 95814

All written comments on this RDEIR should be addressed to:

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After close of the comment period, the City will consider all comments received on this RDEIR, prepare responses as required, and prepare the FEIR. The FEIR, which will consist of the DEIR, RDEIR, comments on the DEIR, comments on the RDEIR, responses to comments, and any text changes, will be considered by the City Council and the LAFCo Board of Commissioners for certification if it is determined that the FEIR has been completed in compliance with CEQA. Following certification of the EIR, the City Council and Sacramento LAFCo Board of Commissioners will consider the proposed project for approval.

3 PROJECT DESCRIPTION

This recirculated draft environmental impact report (RDEIR) evaluates the environmental effects of development of the Greenbriar development project (proposed project). No changes to the proposed project have occurred since publication of the previous DEIR on July 14, 2006.

3.1 PROJECT LOCATION

The project site encompasses approximately 577 acres located northwest of the intersection of State Route 70/99 (SR 70/99) and Interstate 5 (I-5) in Sacramento County. The project site is located in the unincorporated portion of Sacramento County, adjacent to and west of the City of Sacramento and outside the City of Sacramento's (City's) existing Sphere of Influence (SOI).

The project site is bordered by agricultural and rural residential land uses to the west and north, I-5 and agricultural lands to the south, and SR 70/99 and a new residential community currently under development within North Natomas to the east and south. Regional access to the project site is provided from SR 70/99 and I-5 (Exhibit 3-1). Local access to the project site is provided by Elkhorn Boulevard (Exhibit 3-2).

3.2 EXISTING SETTING

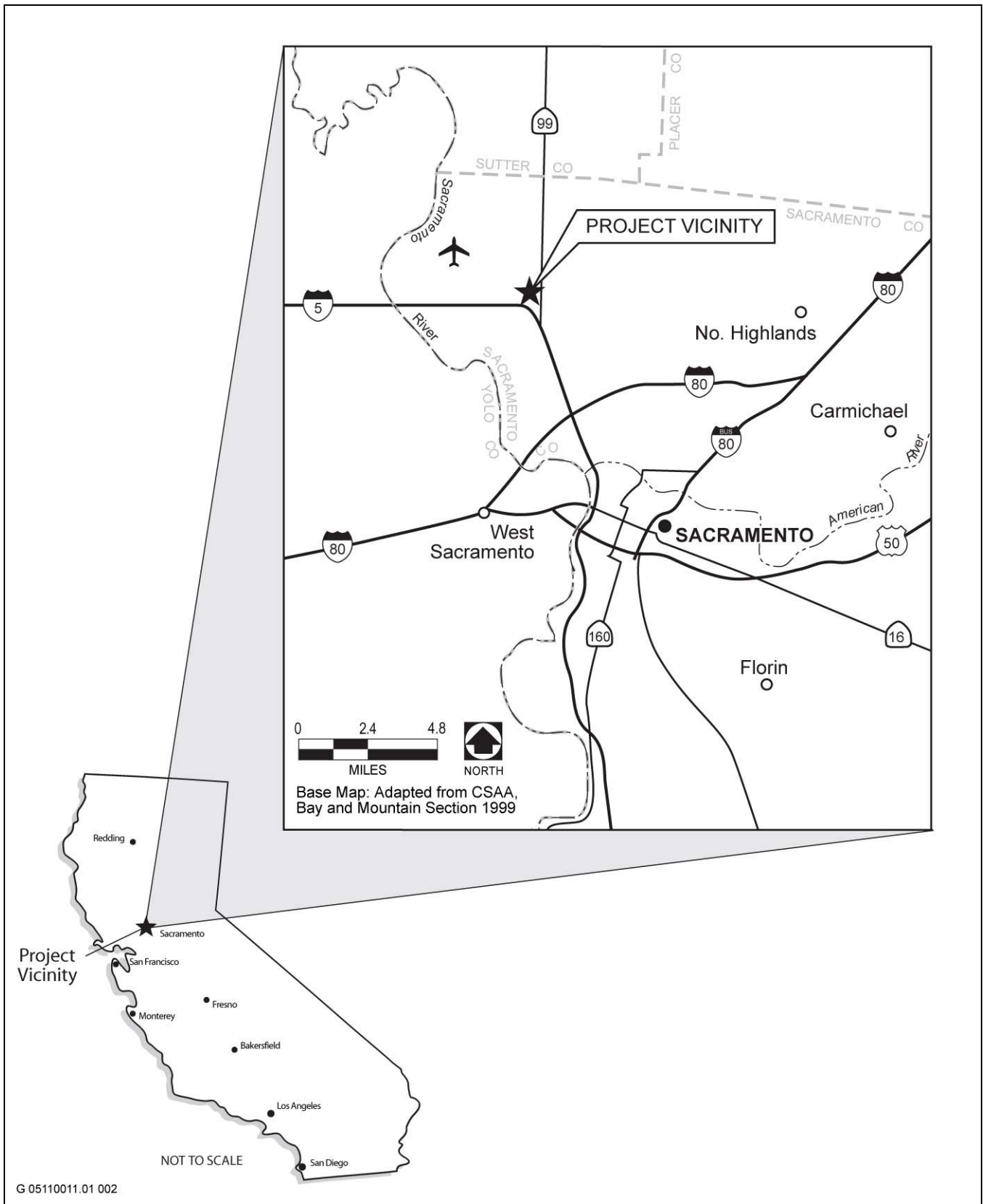
The project site consists of 12 parcels of land that have been in agricultural production and agricultural support uses. As of the publication of the notice of preparation (NOP) for the DEIR, the project site was fallow; however, the site has historically been rotated from fallow to active crop cultivation conditions. The majority of the site consists of former rice fields and associated water canals. Other crops that have been cultivated on-site include alfalfa and hay. A racehorse training facility was located in the northwest corner of the project site, but it has since been demolished and only some remnant building foundations and the dirt racetrack remain. Other buildings that were located on the project site include agricultural outbuildings, greenhouses, and other support structures (e.g., wells) (Exhibit 3-3). All on-site buildings have been demolished and removed from the site.

Surrounding land uses include agricultural land uses to the north and south, new residential development in the North Natomas community to the east and south, and the recently approved Metro Air Park development project to the west. The Metro Air Park development consists of proposed commercial, hotel, and recreational (i.e., golf course) land uses. The North Natomas Community Plan (NNCP) area is located adjacent to the eastern boundary of the project site across SR 70/99. Future development in the North Natomas area includes residential and commercial land uses.

The project site is located approximately 1 mile east of the Sacramento International Airport. The western two-thirds of the project site is located within the airport overflight safety zone. The airport overflight safety zone defines the area in which airplanes taking off or landing have the greatest opportunity to fly directly over the project site.

3.3 PROJECT PURPOSE

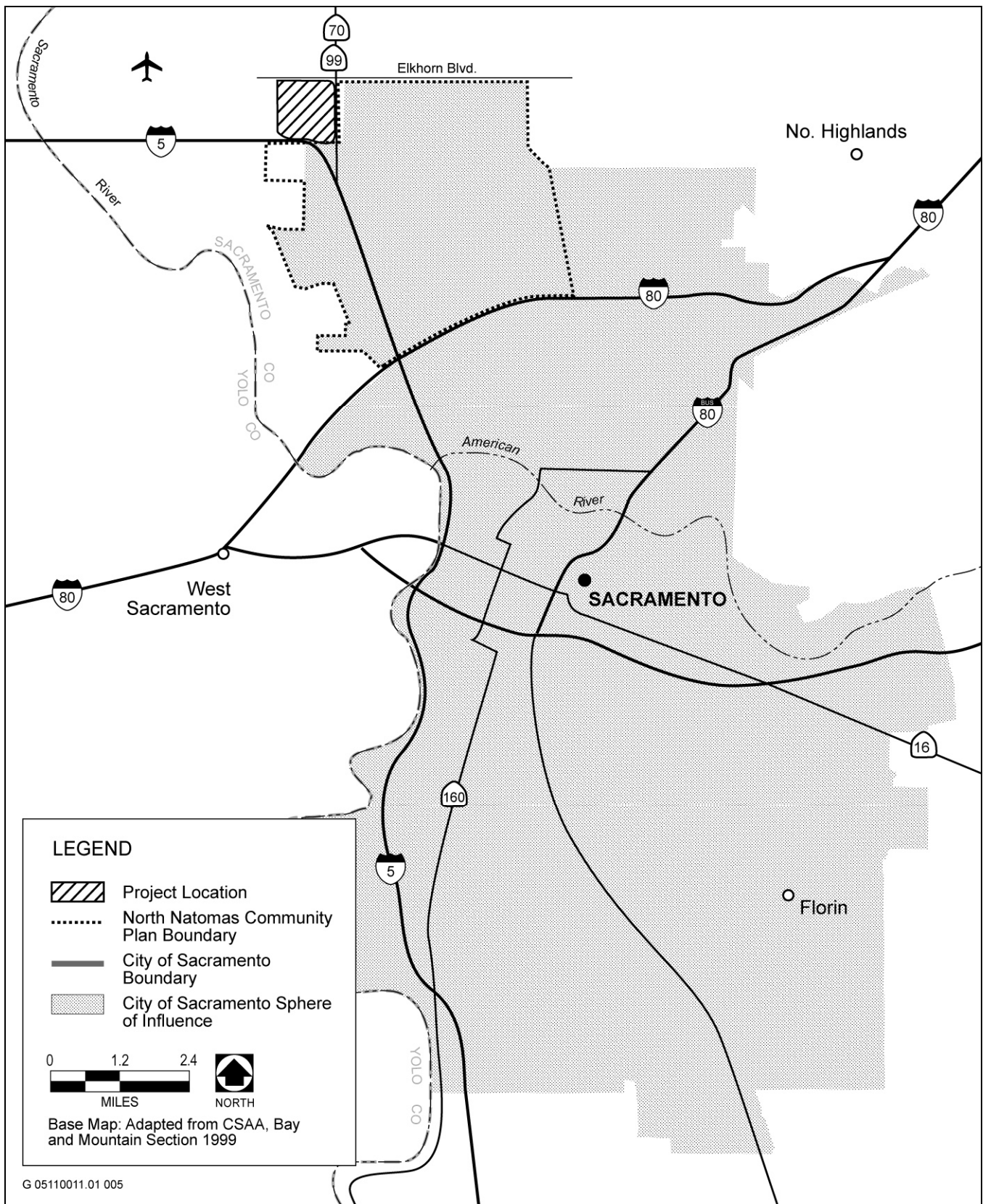
The proposed plan, land uses, zoning, and public improvements for the project site would create a residential development that provides access to alternative modes of transportation (e.g., light rail, bicycle, walking) to on-site commercial and retail centers and to off-site employment centers. The project would provide a variety of housing types at an intensified density along with mixed-use development to promote use of alternative modes of transportation. The project's use of a grid street pattern would provide multiple access routes to destinations on-site and off-site and would allow for narrower streets within residential neighborhoods.



Source: EDAW 2005

Project Vicinity Map

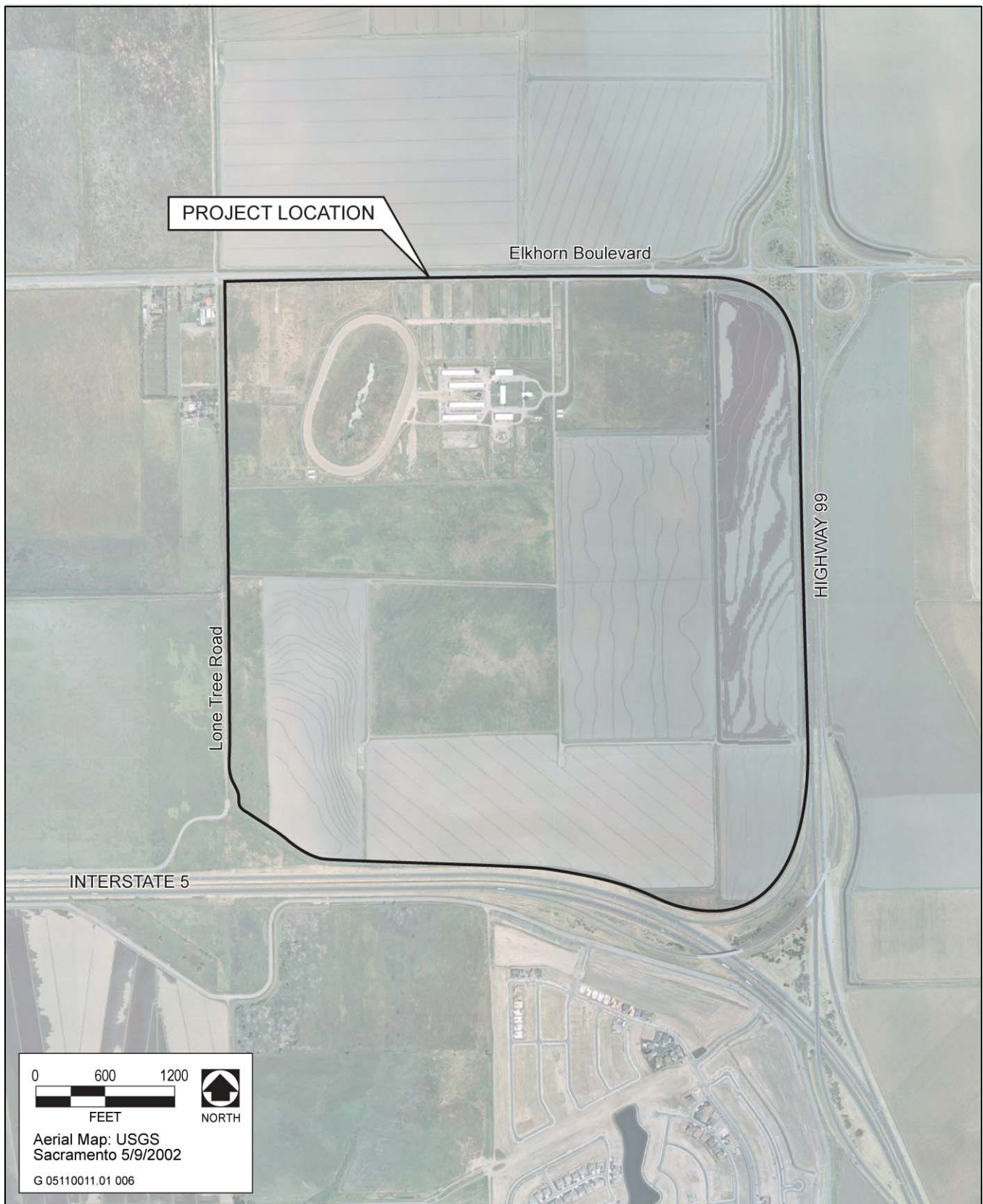
Exhibit 3-1



Source: EDAW 2005

Project Location Map

Exhibit 3-2



Source: EDAW 2005

Aerial Map of the Project Site

Exhibit 3-3

The purpose of the project is to create a mixed-use neighborhood through the development of retail and commercial uses, multifamily attached homes, and high-density single-family detached homes. In addition, the project would allow for future on-site retail and commercial development in support of surrounding housing. The project also promotes the use of public transportation by incorporating a light rail station at the core of development.

3.4 PROJECT OBJECTIVES

The project has the following project objectives:

- ▶ create a quality residential development near the major employment centers of downtown Sacramento and Metro Air Park;
- ▶ create a transit-oriented, pedestrian-friendly development;
- ▶ provide development and land for construction of a light rail stop along the proposed Downtown-Natomas-Airport light rail line with densities that would support the feasibility of a light rail line;
- ▶ develop the project site in a manner consistent with and supportive of the Sacramento Area Council of Government's (SACOG's) Blueprint plan;
- ▶ develop a project that is consistent with the Sacramento International Airport Comprehensive Land Use Plan (CLUP) to the degree feasible;
- ▶ design a project that promotes using various modes of transportation by locating high-density residential development within one-quarter mile of the proposed light rail station;
- ▶ provide vertically and horizontally mixed-use neighborhoods;
- ▶ provide neighborhood and community retail near residential development to shorten or reduce the number of vehicle trips;
- ▶ incorporate parks and open space into the project design in a manner that provides community connectivity;
- ▶ create a residential development with a variety of housing types;
- ▶ provide park and recreation opportunities within walking distance of residents;
- ▶ provide an elementary school site to serve the project's student demands;
- ▶ encourage walking and bicycle use by designing residential areas in a grid street pattern;
- ▶ make efficient use of development opportunity as the project site is bordered on three sides by existing or planned urban development;
- ▶ satisfy the requirements of the City of Sacramento's Inclusionary Housing Ordinance in part by providing an age-restricted facility (senior housing, retirement community) located near transit and other services that are affordable to very-low- and low-income households;
- ▶ ensure adequate, timely, and cost effective public services for the project; and
- ▶ develop and implement the project consistent with the General Plan Update Vision and Guiding Principles adopted by the City of Sacramento.

3.5 PROJECT CHARACTERISTICS

3.5.1 LAND USES

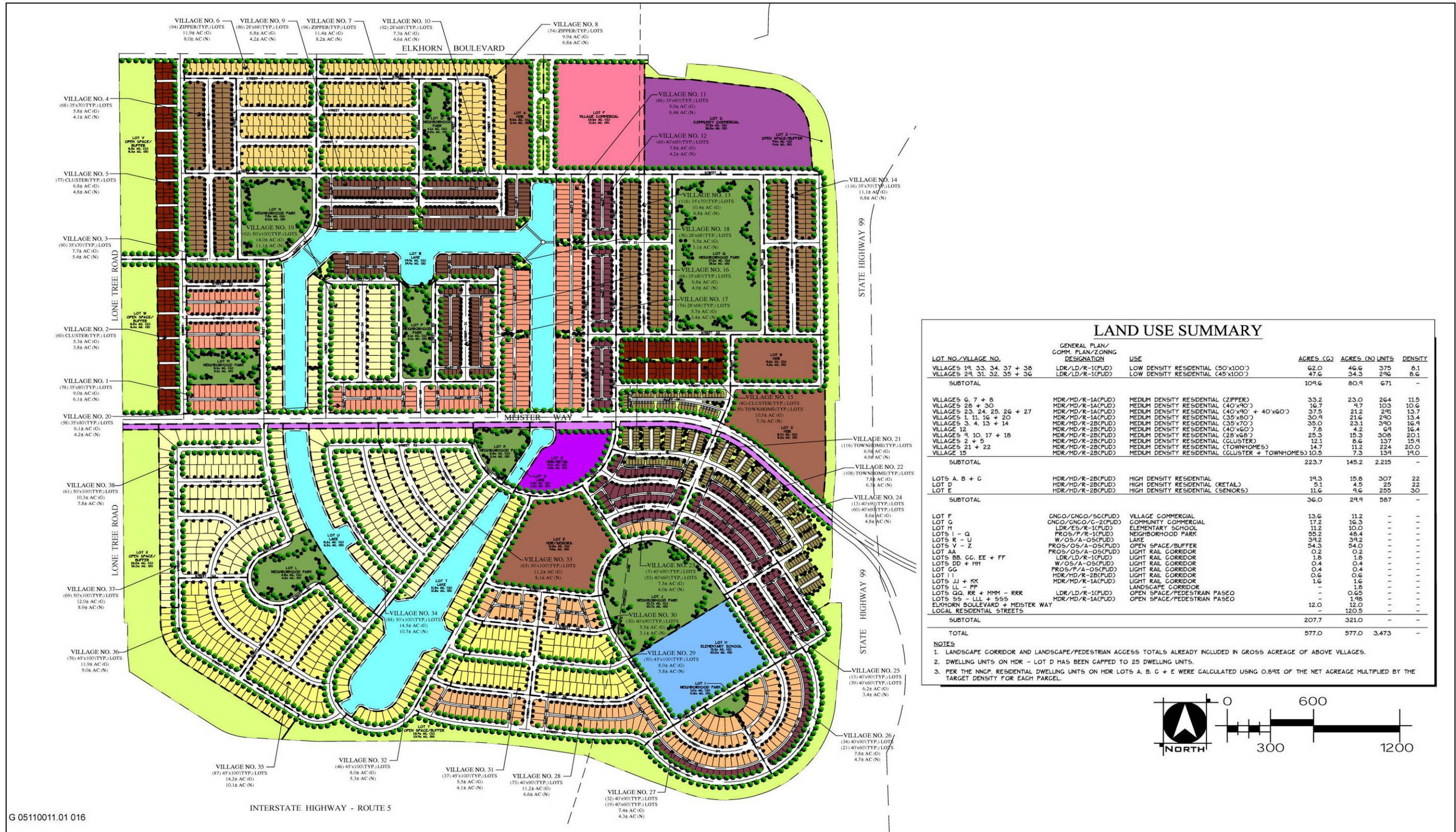
The project includes the construction of a range of housing types (e.g., high-, medium-, low-density) that would be located within close proximity of public transportation systems (Exhibit 3-4). The proposed land use plan is a predominantly residential development centered on a common lake/detention basin (approximately 39 acres). A total of 3,473 housing units and approximately 27.5 net acres of retail and commercial space would be provided on-site. A 10-acre (net) elementary school would be provided in the southeastern portion of the project site and would meet the school demands of the project site. A total of eight neighborhood parks (48.5 net acres) would be provided throughout the community and would be connected by the central lake/detention basin and pedestrian paths and trails. Along with this, the project incorporates a 250-foot linear open space/buffer along the western edge of the site adjacent to Lone Tree Canal (measured from the center of the canal) for the protection of giant garter snake habitat. This area is proposed to be preserved as natural habitat and would only undergo periodic maintenance activities to ensure that the primary objective of providing quality giant garter snake habitat is preserved. No facilities (e.g., trails, paths) or other activities would occur within this corridor. Two other groundwater wells would be constructed near the lake/detention basin and would be used periodically (if at all) to maintain adequate water levels in the lake/detention basin. The project applicant would also grant a navigation easement over the project site to the Sacramento International Airport. This easement would require title notification to future residents of the project site that aircraft operations occur less than 1 mile east of the site and that those occupants could be subject to increased noise levels associated with aircraft overflights.

The project would also provide an age-restricted facility that provides housing for seniors and retirees to satisfy the requirements of the City's Inclusionary Housing Ordinance (Section 17.190 of the City of Sacramento Zoning Code). The Inclusionary Housing Ordinance requires that 10% of housing units in new developments be affordable to very-low-income households and 5% of housing units affordable to low-income households. Development of senior housing would create a retirement community that would serve very-low and low-income households and would increase the mixture of housing types within the project. The total number of housing units proposed to be developed as part of the project is shown in Table 3-1 below.

Medium- and high-density housing and retail land uses would be located in the center of the project site along a new arterial (Meister Way) that connects the project site to the North Natomas Community to the east via a new overpass over SR 70/99 and Metro Air Park to the west. Easements would be provided for a new light rail station to be constructed along this new roadway arterial by Sacramento Regional Transit (RT), and RT intends to provide a new light rail stop along RT's proposed Downtown-Natomas-Airport light rail line. Commercial development would be located primarily in the northeastern portion of the project site along Elkhorn Boulevard. The project includes the construction of 155,000 square feet of large-format retail uses (including a 10,000-square-foot garden center), 67,000 square feet of grocery uses, and 66,000 square feet of retail shops on the village and community commercial designated parcels (Exhibit 3-4) for a total of 288,000 square feet of commercial services.

3.5.2 ANNEXATION AND SPHERE OF INFLUENCE EXPANSION

The project site is currently located in the County of Sacramento, adjacent to and west of the corporate limits and SOI of the City of Sacramento, and outside the City of Sacramento's SOI. The applicant requests approval by the Sacramento Local Agency Formation Commission (LAFCo) for amendment of the City's SOI and annexation of the project site into the City consistent with the Memorandum of Understanding.



LAND USE SUMMARY

LOT NO./VILLAGE NO.	GENERAL PLAN/ COMM. PLAN/ZONING DESIGNATION	USE	ACRES (G)	ACRES (N)	UNITS	DENSITY
VILLAGES 19, 33, 34, 37 + 38	LDR/LD/R-1(PUD)	LOW DENSITY RESIDENTIAL (50'x100')	62.0	46.6	375	8.1
VILLAGES 24, 31, 32, 35 + 36	LDR/LD/R-1(PUD)	LOW DENSITY RESIDENTIAL (45'x100')	47.6	34.3	296	8.6
SUBTOTAL			109.6	80.9	671	-
VILLAGES 6, 7 + 8	MDR/MD/R-1A(PUD)	MEDIUM DENSITY RESIDENTIAL (ZIPPER)	33.2	23.0	264	11.5
VILLAGES 28 + 30	MDR/MD/R-1A(PUD)	MEDIUM DENSITY RESIDENTIAL (40'x90')	16.7	9.7	103	10.6
VILLAGES 23, 24, 25, 26 + 27	MDR/MD/R-1A(PUD)	MEDIUM DENSITY RESIDENTIAL (40'x90' + 40'x60')	37.5	21.2	291	13.7
VILLAGES 1, 11, 16 + 20	MDR/MD/R-1A(PUD)	MEDIUM DENSITY RESIDENTIAL (35'x80')	30.9	21.6	290	13.4
VILLAGES 3, 4, 13 + 14	MDR/MD/R-2B(PUD)	MEDIUM DENSITY RESIDENTIAL (35'x70')	39.0	23.1	390	16.9
VILLAGE 12	MDR/MD/R-2B(PUD)	MEDIUM DENSITY RESIDENTIAL (40'x60')	7.8	4.2	69	16.4
VILLAGES 9, 10, 17 + 18	MDR/MD/R-2B(PUD)	MEDIUM DENSITY RESIDENTIAL (28'x68')	25.3	15.3	308	20.1
VILLAGES 2 + 5	MDR/MD/R-2B(PUD)	MEDIUM DENSITY RESIDENTIAL (CLUSTERS)	12.1	8.6	137	15.9
VILLAGES 21 + 22	MDR/MD/R-2B(PUD)	MEDIUM DENSITY RESIDENTIAL (TOWNHOMES)	14.7	11.2	224	20.0
VILLAGE 15	MDR/MD/R-2B(PUD)	MEDIUM DENSITY RESIDENTIAL (CLUSTER + TOWNHOMES)	10.5	7.3	134	14.0
SUBTOTAL			223.7	145.2	2,215	-
LOTS A, B + C	HDR/HD/R-2B(PUD)	HIGH DENSITY RESIDENTIAL	19.3	15.8	307	22
LOT D	HDR/HD/R-2B(PUD)	HIGH DENSITY RESIDENTIAL (RETAIL)	5.1	4.5	25	22
LOT E	HDR/HD/R-2B(PUD)	HIGH DENSITY RESIDENTIAL (SENIORS)	11.6	9.6	255	30
SUBTOTAL			36.0	29.9	587	-
LOT F	CNGO/CNGO/SC(PUD)	VILLAGE COMMERCIAL	13.6	11.2	-	-
LOT G	CNGO/CNGO/C-2(PUD)	COMMUNITY COMMERCIAL	17.2	16.3	-	-
LOT H	LDR/ES/R-1(PUD)	ELEMENTARY SCHOOL	11.2	10.0	-	-
LOTS I - Q	PROS/P/R-1(PUD)	NEIGHBORHOOD PARK	55.2	48.4	-	-
LOTS R - U	W/OS/A-OS(PUD)	LAKE	39.2	39.2	-	-
LOTS V - Z	PROS/OS/A-OS(PUD)	OPEN SPACE/BUFFER	54.3	54.0	-	-
LOT AA	PROS/OS/A-OS(PUD)	LIGHT RAIL CORRIDOR	0.2	0.2	-	-
LOTS BB, CC, EE + FF	LDR/LD/R-1(PUD)	LIGHT RAIL CORRIDOR	1.8	1.8	-	-
LOTS DD + HH	W/OS/A-OS(PUD)	LIGHT RAIL CORRIDOR	0.4	0.4	-	-
LOT GG	PROS/P/A-OS(PUD)	LIGHT RAIL CORRIDOR	0.4	0.4	-	-
LOT II	HDR/HD/R-2B(PUD)	LIGHT RAIL CORRIDOR	0.6	0.6	-	-
LOTS JJ + KK	MDR/MD/R-1A(PUD)	LIGHT RAIL CORRIDOR	1.6	1.6	-	-
LOTS LL - PP	W/OS/A-OS(PUD)	LANDSCAPE CORRIDOR	-	1.8	-	-
LOTS QQ, RR + MMM - RRR	LDR/LD/R-1(PUD)	OPEN SPACE/PEDESTRIAN PASEO	-	0.65	-	-
LOTS SS - LLL + 555	MDR/MD/R-1A(PUD)	OPEN SPACE/PEDESTRIAN PASEO	-	1.98	-	-
ELKHORN BOULEVARD + MEISTER WAY			12.0	12.0	-	-
LOCAL RESIDENTIAL STREETS			-	120.5	-	-
SUBTOTAL			207.7	321.0	-	-
TOTAL			577.0	577.0	3,473	-



G 05110011.01 016
Source: Wood Rodgers, September 2005

**Table 3-1
Proposed Housing Types and Number of Units**

Housing Type	Number of Housing Units
Low-Density	
50 x 100-foot lots	375
45 x 100-foot lots	296
Subtotal	671
Medium-Density	
Zipper lots ^a	264
45 x 90-foot lots	103
40 x 90-foot + 40 x 60-foot lots	291
35 x 80-foot lots	290
35 x 70-foot lots	390
40 x 60-foot lots	69
28 x 68-foot lots	308
10-unit cluster	217
Townhomes	283
Subtotal	2,215
High-Density	
Apartments	307
Senior housing	255
Mixed-use housing	25
Subtotal	587
Total Housing Units	3,473
^a Lot design in which rear lot line moves back and forth to vary the depth of the rear yard and concentrate open space on the side of lot. Source: Data compiled by EDAW 2005	

A variety of public services would be provided to the project site by the City and other local/regional service agencies including the Sacramento Regional County Sanitation District (SRCSD) (wastewater), City of Sacramento (water, parks and recreation, fire, and police), Reclamation District Number 1000 (RD 1000) (stormwater), Rio Linda Union School District and Grant Joint Union High School District (schools), Sacramento Police Department, and Sacramento Fire Department.

The project site lies within the service area of these service providers, with the exception of SRCSD and Sacramento Police Department. The project site is adjacent to and east of SRCSD's SOI. As such, before SRCSD can provide service to the project site, the project would require approval from LAFCo for the amendment of SRCSD's SOI to include the project site. The City would be responsible for providing law enforcement services after annexation of the project site into the city.

3.5.3 GENERAL PLAN AMENDMENT, GENERAL PLAN UPDATE, AND SACOG BLUEPRINT

The project would require the amendment of the City’s existing general plan land use designations on the project site from AG-80 (agricultural cropland uses/80-acre minimum lot size) to land use designations that would be consistent with proposed land uses as described in Table 3-2. The project would also amend the boundaries of the NNCP. The project includes the adoption of Planned Unit Development (PUD) Guidelines and the Greenbriar Finance Plan, which would guide development of the project.

Table 3-2 Proposed City Land Use Designations and Acreages (Net) for the Project Site		
Designation	General Plan Land Use	Acres
LDR	Low-density residential (4–15 du/ac)	80.9
MDR	Medium-density residential (16–29 du/ac)	145.2
HDR	High-density residential (30+ du/ac)	29.9
PROS	Neighborhood park/Open space/Buffer	105
W	Water	39.2
LDR	Elementary school	10.0
CNCO	Community/Village commercial	27.5
--	Major and secondary roads	12.0
--	Local Residential Streets	120.4
--	Light Rail Corridor	5.0
--	Landscape Corridor	1.8
Total		576.9

Note: du/ac = dwelling units per acre

The project would generally be consistent with the City of Sacramento General Plan Update Vision and Guiding Principles document adopted in November 2005, and SACOG’s Seven Principles of Smart Growth used to develop the regional blueprint. The project’s compliance with these two sets of broad policy directives will be described in the Planned Unit Development Design Guidelines prepared for the project. The City will consider adoption of the Planned Unit Development Design Guidelines as one of several discretionary actions necessary to approve the project as described in Section 3.6, “Required Discretionary Actions.”

3.5.4 ZONING AMENDMENT

The project would also require a zoning amendment to change the City’s existing zoning designations for the project site from the current designation of AG-80 (agricultural cropland uses/80-acre minimum lot size) to zoning designations that are consistent with proposed land uses as described in Table 3-3.

**Table 3-3
Proposed Zoning Designations and Acreages for the Project Site**

Designation	Land Use	Acres
R-1 (PUD)	<i>Low-density residential/Elementary School:</i> Allows residential land uses with densities from four to 15 dwelling units per acre. Typical development will include single-family detached units, duplexes, halfplexes, townhomes, condominiums, zero-lot-line units, and cluster units (City of Sacramento 1988).	90.9
R-1A (PUD)	<i>Medium-density residential:</i> Allows multiple-family dwellings with densities ranging from 16 to 29 dwelling units per acre. Typical development will include condominiums, garden apartments, and light-density apartment uses (City of Sacramento 1988).	86.7
R-2B (PUD)	<i>High-density residential:</i> Allows a mixture of residential densities along with limited commercial or office use with densities from 30 to 156 units per net acre (City of Sacramento 1988).	88.4
A-OS (PUD)	<i>Neighborhood park/Open space/Buffer/Water:</i> Allows development of neighborhood parks and open space areas consistent with the General Plan’s definition for such uses. The buffer designation allows an enhanced movement corridor for giant garter snake. The water features allow development of a lake/detention basin that would detain water on a year-round basis.	146.0
SC (PUD)	<i>Village commercial:</i> Allows development of commercial centers that are intended to serve as the focal point for two to four neighborhoods. The anchor tenant would be a grocery store and/or drugstore.	11.2
C-2 (PUD)	<i>Community commercial:</i> Allows development of commercial centers that offer comparison shopping as well as convenience items. The anchor tenant would be a junior department store, large variety, or discount store. Other tenants may include specialty clothing stores, furniture or appliance stores, jewelry stores, and entertainment services.	16.3
--	Major and secondary roads	132.4
--	Light rail corridor	5.0
Total		576.9

3.5.5 PARKS AND OPEN SPACE

The project includes several park and open space features, including greenbelt areas along I-5, SR 70/99, and Elkhorn Boulevard; a 250-foot linear open space/buffer along the Lone Tree Canal (measured from the center of the canal), the western edge of the project site, for the protection of giant garter snake habitat; bike and pedestrian trails located throughout the proposed community; and 48.4 net acres of parks. A 10-acre neighborhood park would be located adjacent to the proposed elementary school in the southeast portion of the site. A total of six smaller park sites (i.e., park sites ranging from 2 to 6 acres) would be located in the eastern half of the project site north and south of Meister Way. A 23-acre community park site would be located in the northeast quadrant of the project site. Exhibit 3-4 presents the general location of the proposed park facilities; however, since preparation of this site plan, the applicant in coordination with the City of Sacramento has made minor adjustments to the park acreages to better reflect the City’s goal for park development within the project site. These changes have been described above.

3.5.6 TRANSPORTATION FACILITIES AND CIRCULATION

The project includes the construction of the Meister Way overpass over SR 70/99. This overpass would generally be located near the center of the project site and would connect the project site to the North Natomas Community east of the project site. In addition, Meister Way would be extended west of the project site once the Metro Air Park project is constructed (discussed further in Section 3.7, “Related Projects”). The proposed overpass would consist of two lanes (one lane in each direction) and pedestrian sidewalks on either side of the roadway. The

overpass would extend from East Commerce Way east of the site to its first intersection within the project site. The project applicant would contribute its fair share to funding this improvement, which would ultimately be constructed under the direction of the City. Timing of construction of this improvement is linked to an increase in project trips as described in Section 4.1, “Transportation and Circulation.”

Other proposed transportation improvements would include the widening of Elkhorn Boulevard to provide adequate ingress and egress at the project site (e.g., turning lanes) and construction of an internal roadway circulation network. The project would provide automobile access to off-site locations via Elkhorn Boulevard at the northern project boundary, Lone Tree Road at the western project boundary, SR 70/99 at the eastern boundary, and Meister Way, which passes through the center of the project site in an east-west direction (Exhibit 3-4). Meister Way would connect to areas east of the project site via a new roadway overpass over SR 70/99. The overpass is an element of the proposed project and would extend from East Commerce Way east of the project site to its first intersection within the project site.

The project site is located along the proposed Downtown-Natomas-Airport light rail line and includes dedication of a corridor that could accommodate a future transit stop and light rail alignment located near the center of the project site along the proposed Meister Way roadway. The light rail station would provide public transportation access to downtown Sacramento, the Sacramento International Airport, and Metro Air Park.

On-site vehicle circulation would be provided by local residential streets and collector streets through each neighborhood. All roadways except for local residential neighborhood streets, including the Meister Way overpass, would include a separate bike lane (Class II). Sidewalks and green spaces would be located throughout residential neighborhoods to allow pedestrian access throughout the development and to surrounding areas. Approximately 3.9 acres of pedestrian trails would be provided around the on-site lake/detention basin.

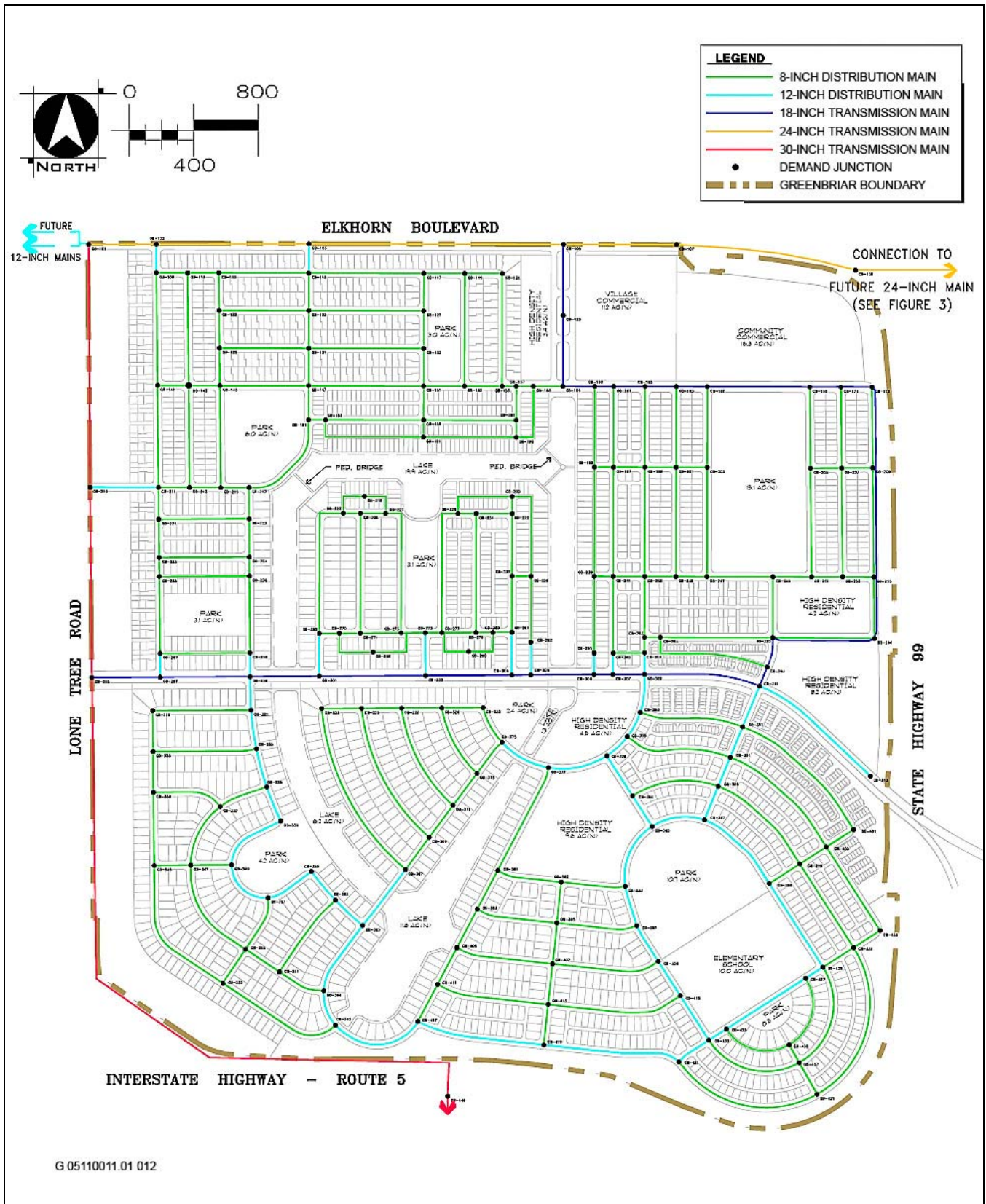
Using Meister Way as an east-west dividing line through the project site, vehicle circulation in the northern portion of the project site is focused along a grid pattern (no use of cul-de-sacs) of streets extending through residential neighborhoods and neighborhood parks. The northern portion has four access points along Elkhorn Boulevard and eight access points from Meister Way. The southern portion of the project site also includes a grid pattern with streets extending through residential neighborhoods and neighborhood parks in a curvilinear form. The southern portion has three access points from Meister Way. These three access points also extend north across Meister Way to provide a connection to the northern and southern parts of the project site. The use of a grid pattern for streets throughout the project site provides multiple access points and routes to on- and off-site areas.

3.5.7 INFRASTRUCTURE PLANS

The project would include phased expansion and extension of public utility infrastructure from adjacent areas (e.g., NNCP area) to the project site. Infrastructure plans would specify the size and locations of pipelines necessary to convey potable water, wastewater (including pump and lift stations if necessary), and stormwater drainage to and from the project site. In addition, locations for placing electrical infrastructure and natural-gas lines would also be identified on the plans.

Water Facilities

The main water supply for the project site would be a 30-inch transmission line that would be extended from South Bayou Road (south of the project site) under I-5 (via a jack-and-box construction method) (Exhibit 3-5) to Elkhorn Boulevard. Additional reliability and redundancy in the water distribution system would be provided through a 24-inch transmission line that would be constructed from Natomas Boulevard and Elkhorn Boulevard (east of the project site) to the intersection of Lone Tree Road and Elkhorn Boulevard, where it would connect to on-site distribution facilities. The proposed water distribution system would consist of a grid of 8-inch and



Source: Wood Rodgers 2005

Water Distribution System

Exhibit 3-5

12-inch distribution mains throughout areas designated for residential land uses. An 18-inch transmission main would run under Meister Way from the western edge of the project site to the east; it would then run north between two parcels designated for high-density residential land uses (near the eastern boundary), east along the boundary of the site, and would terminate at a 24-inch transmission main located in Elkhorn Boulevard. Three groundwater wells would be constructed on-site: one to periodically maintain flow in Lone Tree Canal, and two to maintain (if needed) flows within the on-site lake detention basin.

Wastewater Facilities

The project includes the construction of a gravity-flow and force-main wastewater collection system. Approximately one-quarter of the site would be served by a gravity-flow system that would connect to the existing 33-inch North Natomas interceptor located at the terminus of Greg Thatch Circle (immediately east of the project site) (Exhibit 3-6). The remaining portions of the project site would be served by gravity flow to a centrally located lift station. Flows from the lift station would be conveyed by a 16-inch sewer force main that would ultimately connect to the 33-inch North Natomas Interceptor along the northwestern boundary of the property.

STORM DRAINAGE FACILITIES

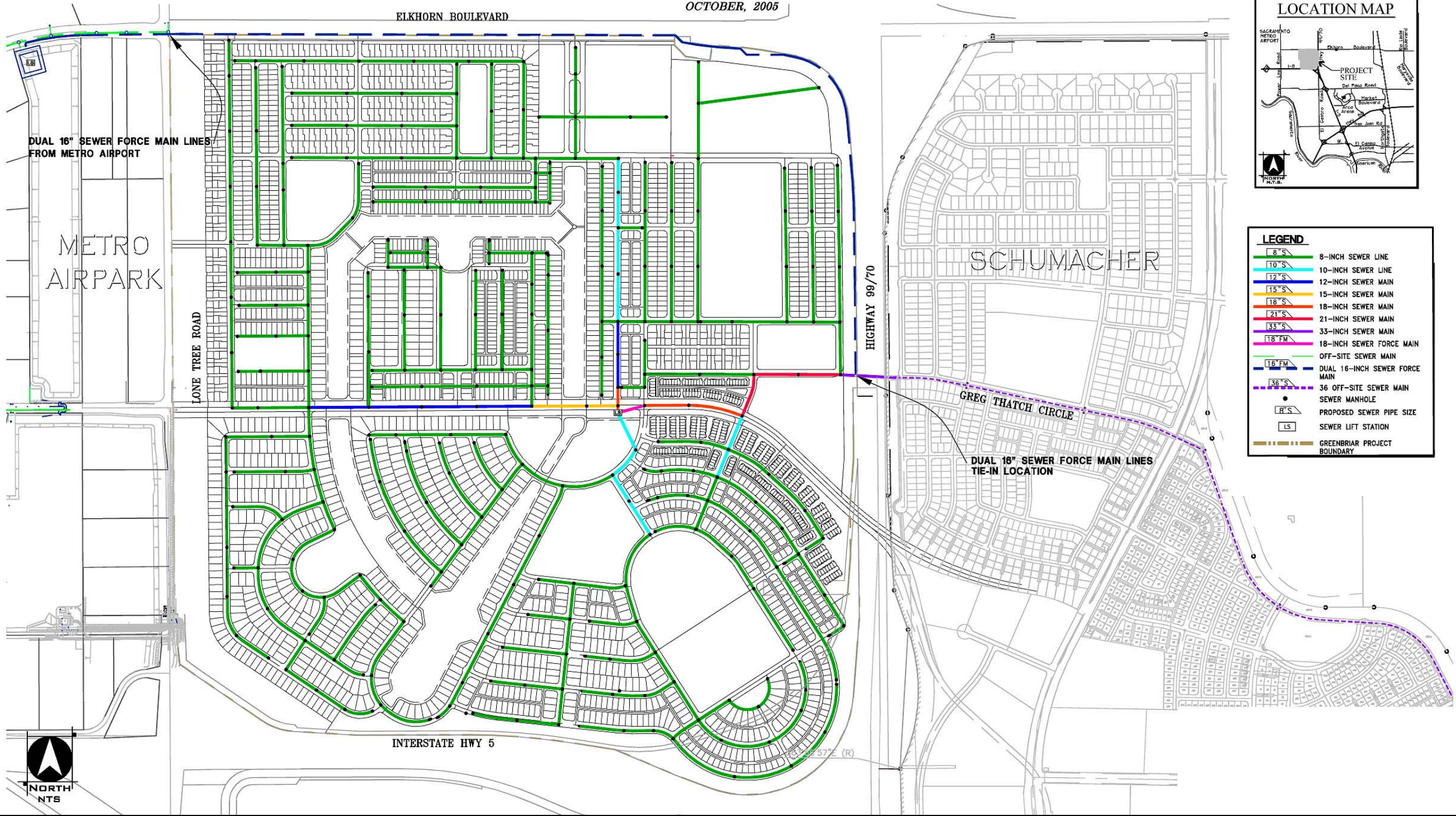
The project includes the construction of an approximately 39-acre lake/detention basin. The project site would be graded to create building pads and streets that would direct drainage to the lake/detention basin. Storm drainage trunk lines within the project site would be sized from 24 to 54 inches and would convey on-site stormwater to the lake/detention basin, which would use a gravity outfall to discharge flows into the West Drainage Canal through two 78-inch reinforced concrete pipes and three 8-foot by 5-foot box culverts at the I-5 undercrossing located in the southwestern portion of the project site.

3.5.8 CONSTRUCTION PLANS

Construction activities associated with project development would include grubbing/clearing of on-site areas, excavation and relocation of soil on the site (i.e., balanced grading), backfilling and compaction of soils, construction of utilities (i.e., potable-water conveyance, wastewater conveyance, stormwater drainage facilities, underground electrical and natural-gas facilities), and construction of proposed buildings associated with residential and commercial land uses. With the exception of proposed infrastructure connections, all construction activities would occur within the 577-acre site. Off-site infrastructure (e.g., water and sewer pipelines) construction would generally occur within existing roadways and would encompass an approximately 50-foot corridor. The Meister Way overpass and Elkhorn Boulevard improvements would also occur in existing roadway alignments. Construction equipment would vary day-to-day depending on activities occurring, but would involve operation of scrapers/earthmovers, wheeled dozers, water trucks, forklift, wheeled loaders, and a motor grader. A maximum of 250 workers would commute to the project site on a daily basis. Construction workers would access the site via Elkhorn Boulevard and SR 70/99. The project would be developed in two phases with Phase 1 developing land north of Meister Way and Phase 2 developing land south of Meister Way. Following the initial site preparation (grubbing, clearing, grading) phase, building construction would commence. Construction of the project is anticipated to begin in spring/summer 2007 and would last approximately 5–10 years.

Timing of construction of the proposed Meister Way overpass would be determined based on project transportation impacts identified in Section 4.1, “Transportation and Circulation,” and through the financing plan prepared for this project, which would be prepared in consultation with the City of Sacramento. Timing for the extension of light rail service and construction of a light rail station would depend on Sacramento Regional Transit’s schedule for implementation, which is currently unknown at this time.

**SEWER SYSTEM LAYOUT FOR
GREENBRIAR
CITY OF SACRAMENTO**
SACRAMENTO, CALIFORNIA
OCTOBER, 2005



G 05110011.01 011

Source: Wood Rodgers 2005

Wastewater Conveyance System

Exhibit 3-6

3.6 REQUIRED DISCRETIONARY ACTIONS

Project approval requires the lead agencies (and responsible agencies) to approve the project or project components, issue required permits, or affirm compliance with agency requirements. The Sacramento LAFCo and City of Sacramento are the co-lead agencies for the Greenbriar project. A lead agency, as defined in Section 15367 of the California Environmental Quality Act Guidelines (State CEQA Guidelines), is “the public agency that has the principal responsibility for carrying out or approving a project.” Described below are the environmental review process for the project and the discretionary actions sought by the project applicant for the Greenbriar project that the City and LAFCo will consider during its review. The City is the project applicant for LAFCo proceedings (i.e., SOI amendment [SOIA] and reorganization).

- ▶ The DEIR will be circulated for public review and comment, as described in Chapter 1, “Introduction.”
- ▶ The City will refer the project to the Sacramento County Airport Land Use Commission (ALUC) for a review of the project’s consistency with the Comprehensive Land Use Plan (CLUP).
- ▶ The Sacramento LAFCo will hold a public hearing during the public review period, at which time individuals and public agencies may comment on the adequacy of the DEIR.
- ▶ ALUC will issue a consistency determination for the project.
 - If ALUC determines that the project is inconsistent with the CLUP, the City will review ALUC’s decision and will determine whether to issue a Statement of Override for ALUC’s decision.
 - If a Statement of Override is issued by the City, the City will forward a notice of its decision to ALUC 45 days before the City takes action to override ALUC’s decision.
 - Within 30 days of receiving the City’s notice to override its consistency determination, ALUC will submit its findings to the City.
- ▶ After the close of the public review period for the DEIR, the final EIR (FEIR), consisting of all comments received on the DEIR together with responses to those comments and necessary changes to the EIR text, will be prepared and circulated to public agencies for a 10-day review period.
- ▶ After the close of the 10-day review period, LAFCo will hold a public hearing at which it will consider the adequacy of the FEIR regarding the SOIA only, including review of written comments on the adequacy of the FEIR response to comments on the DEIR.
- ▶ After certification of the FEIR by LAFCo, the commission will then consider the merits of the project as it relates to the issues of growth projections, rate of buildout, municipal service provision, and open space and prime agricultural resources in a public hearing, at which time the public can comment on the merits of the SOIA application before LAFCo.
- ▶ Applications that LAFCo would consider for approval, conditional approval, or denial include whether to:
 - accept the Municipal Services Review for the project;
 - approve amendment of the City’s SOI to incorporate the project site; and
 - approve amendment of SRCSD’s SOI to incorporate the project site.
- ▶ After LAFCo considers the SOIA and if recommendations for approval or conditional approval are made, the City of Sacramento Planning Commission will hold a public meeting at which it will consider the adequacy of

the FEIR for rezoning, amendment of the NNCP boundaries, and land use entitlements (e.g., general plan amendments, maps, PUD guidelines, and finance plan).

- ▶ When the Planning Commission is satisfied that the FEIR is complete, it will recommend that the City Council certify the FEIR as being adequate according to CEQA requirements.
- ▶ Following the Planning Commission recommendation to the City Council, the Planning Commission will then consider the merits of the project. This consideration could occur during the same meeting at which it considers the adequacy of the FEIR. The Planning Commission will hold a public hearing at which individuals and public agencies can comment on the merits of the project, after which the Planning Commission will recommend approval, conditional approval, or denial of project applications.
- ▶ Entitlement actions under consideration by the Planning Commission during its review of the project merits will include whether to:
 - recommend approval of a prezone of the project site to zoning designations consistent with the proposed development plan and the City's zoning categories;
 - recommend approval of a general plan amendment to amend the City land use designation of AG-80 to low-density residential, medium-density residential, high-density residential, neighborhood park/open space/buffer, water, community/village commercial;
 - recommend approval for review of project to the Sacramento LAFCo to consider approval of reorganization of the project site, annexation into the City of Sacramento, and SRCSD and detachment from Natomas Fire Protection District (FPD);
 - recommend approval for referring the project to the Sacramento City Council to consider approval of the Greenbriar Planned Unit Development Design Guidelines;
 - recommend approval of the project's financing plan (Greenbriar Finance Plan);
 - recommend approval of the project's Senate Bill 610 (SB 610) Water Supply Assessment;
 - recommend approval of large-lot tentative subdivision map;
 - recommend that the City Council repeal Resolution No. 2001-518, which was adopted by the City of Sacramento on July 24, 2001, pursuant to the *Agreement to Settle Litigation in the National Wildlife Federation v. Bruce Babbitt, Secretary of Interior* case;
 - recommend approval of the ALUC override (if an override is determined to be necessary);
 - recommend approval of an inclusionary-housing plan;
 - recommend approval of small-lot tentative subdivision maps; and
 - recommend approval of a development agreement for the project.
- ▶ After the Planning Commission considers the project and if recommendations for approval or conditional approval are made, the City Council would then hold a public meeting, at which time it will decide whether to certify the FEIR.
- ▶ After certification of the FEIR, the City Council will then consider the merits of the project in a public hearing, at which time the public can comment on the merits of the project and applications for project

approval. The City Council will approve, conditionally approve, or deny the Greenbriar project. After approval or conditional approval of the project by the City Council, the City will adopt a resolution to initiate the reorganization (annexation and detachment).

- ▶ After approval or conditional approval of the project by the City Council, LAFCo will hold a public meeting to consider whether to approve, conditionally approve, or deny the reorganization (annexation and detachment) of the project site to the City of Sacramento and SRCSD.
- ▶ Once all project entitlements are obtained from the City of Sacramento and LAFCo, other responsible agencies would consider the project and associated entitlements when considering permitting or other related actions. Examples of potential responsible agency actions that could be required for this project are provided in Section 1.3, “Lead and Responsible Agencies.”

3.7 RELATED PROJECTS

State CEQA Guidelines Section 15130, “Discussion of Cumulative Impacts,” requires an EIR to discuss cumulative impacts of a project when the project’s incremental effect is cumulatively considerable. A cumulative impact consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. The following sections discuss projects that are approved or proposed and would potentially result in environmental impacts that would contribute to cumulative conditions. See Section 7.2, “Cumulative Impacts, for Additional Analysis.”

3.7.1 NORTH NATOMAS COMMUNITY PLAN

The project site is located adjacent to the NNCP area, a developing area in the northern portion of the City of Sacramento. The community plan area consists of approximately 9,000 acres. Within this area the City of Sacramento envisions the development of urban land uses consisting of residential, employment, commercial, and civic land uses that would be interdependent on local transit service and transit routes, including light rail. According to the City of Sacramento, development within the NNCP area as of September 14, 2005, includes approval of 12,162 lots for development of residential, commercial, and industrial land uses; approval of 10,801 building permits; approval of 11,599 single-family residential special permits; and approval of 6,003 multifamily residential special permits.

3.7.2 NORTH NATOMAS JOINT VISION AREA

The project site is located within the North Natomas Joint Vision (Joint Vision) area, which is a collaborative effort between the City and County of Sacramento (County) to develop a vision for the area of the county between the northern city limits and Sutter County. Greenbriar is located within this area. In December 2002, the City Council and County Board of Supervisors entered into a Memorandum of Understanding (MOU), which defined a set of guiding principles for the implementation of the following goals:

- ▶ Proactively guide future urban growth for more efficient use of the land, while securing permanent preservation of open space/farmland at a mitigation ratio of at least one-to-one.
- ▶ Improve future air quality through efficient land use, which reduces automobile travel by accommodating future growth according to Smart Growth principles adopted by City Council (Smart Growth Principles/Resolution).
- ▶ Provide for revenue sharing between the City and County to prevent competition for tax revenues and promote balanced regional planning.
- ▶ Protect future airport operations.

The land use plan has not been developed, but general concepts have been considered. In general, the preferred land use scenario for the Joint Vision area consists of a mixture of residential densities, an industrial park adjacent to the eastern edge of the Sacramento International Airport, and open spaces in the northern extent separating development from the Sutter County boundary. The Joint Vision area's preferred land use scenario specifically for the project site includes the development of high-density mixed residential and single-family small-lot land uses. The proposed project has been designed to be consistent with this preferred land use scenario.

The Joint Vision area includes approximately 10,000 acres, including the Greenbriar project site, and is located outside the City of Sacramento's SOI as established by LAFCo. The City, consistent with its planning efforts for the Joint Vision area, is reviewing the possibility of applying for LAFCo approval of an amendment to the City's SOI boundary to include the Joint Vision area. LAFCo approval of annexation of any such land areas to the City would also require LAFCo approval.

3.7.3 SACRAMENTO REGION BLUEPRINT

The Sacramento Area Council of Governments (SACOG) recently prepared the Sacramento Region Blueprint: Transportation/Land Use Study (Blueprint) (December 2004), which describes how and where the greater Sacramento region should grow, how Sacramento area residents should travel, and how growth within Sacramento affects the environment. The Blueprint process involved consideration of land use patterns throughout the six-county SACOG region (i.e., Sacramento, Placer, Yolo, Yuba, Sutter, El Dorado) and how these patterns could develop over the next 50 years if land use patterns continue along their recent historical course. The intent of the Blueprint is to support an alternative course of development throughout the region that would serve to reduce potential conversion of farmland, open space, and habitat, and provide for a more effective regional transportation system. The Blueprint provides an opportunity for the entire Sacramento region to develop detailed technical data for use by local elected leaders in making their land use decisions. SACOG will also use the Blueprint to decide what transportation projects would best serve the greater Sacramento region as it grows. Although the Blueprint suggests how land uses should develop throughout the region, it is not a land use plan adopted by any land use agencies. Further, it provides guidance to local land use agencies, including the City and County of Sacramento, for how land uses could develop in an orderly and efficient manner while meeting economic, transportation, and environmental objectives.

The Blueprint developed Preferred Scenario Maps that depict an option for how the region should grow through the year 2050 in a manner generally consistent with the Blueprint growth principles. These growth principles generally consist of providing a variety of transportation choices, offering housing choices and opportunities, taking advantage of compact development, using existing infrastructure assets, conserving natural resources, and encouraging distinctive and attractive communities with quality design.

3.7.4 CITY OF SACRAMENTO SPHERE OF INFLUENCE EXPANSION

The City of Sacramento is considering an expansion of its SOI boundary. The proposed SOI expansion would encompass approximately 10,000 acres to the north and west of the current city boundaries. This expansion would generally accommodate the boundaries of the Joint Vision areas as described above in Section 3.7.3, "North Natomas Joint Vision Area."

3.7.5 CITY OF SACRAMENTO GENERAL PLAN UPDATE

The City of Sacramento recently initiated a comprehensive update of its General Plan. The General Plan provides guidance to City decision-makers when making determinations about the allocation of resources and the future physical form and character of development within the city. The General Plan also describes the City's vision for the extent and types of development needed to achieve the community's physical, economic, social, and environmental goals.

Sacramento's existing General Plan was adopted in 1988. Various elements of the General Plan have been updated over time but the overall General Plan has not been comprehensively revised since adoption. Some of the data, analyses, and policies in the existing General Plan do not reflect current conditions in the City. As a result, the City determined that an update of the General Plan is necessary to reflect the current vision for accommodating future growth, as well as what resources to protect and how quality of life is defined, within the City of Sacramento over the next 25 years.

The City of Sacramento recently completed the Technical Background Report for the General Plan Update while the Planning Issues Report, Vision and Guiding Principles, and Land Use Alternatives continue to be drafted. The Technical Background Report is a thorough compilation of existing conditions in the General Plan Study Area including current land uses, transportation systems, environmental factors, and public facilities, and serves as the foundation for determining future land use and infrastructure needs in the City. Preparation of the Draft General Plan itself has not begun. The Draft General Plan process will include a financing plan, an EIR, and public hearings. The Draft General Plan is scheduled to be completed sometime in late 2006 or early 2007.

3.7.6 METRO AIR PARK

The Sacramento County Board of Supervisors approved a Special Planning Area (SPA) Ordinance in 1989 to allow development of Metro Air Park as a high quality, multidistrict, industrial business park that follows the general intent and spirit of the Metro Air Park Land Use Plan, Summary Report. Land uses allowed in the Metro Air Park include airport-related uses, light manufacturing, high-tech research and development, professional offices, limited support retail, and recreation. The Metro Air Park development was created to provide a balanced mix of uses that would ensure economic viability while providing an economic business environment that is complementary to the Sacramento International Airport. Metro Air Park is designed to provide a distinctive identity reflecting the relationship between its land uses to the airport, its orientation around an open space/recreation spine that accommodates drainage and wildlife needs, and its landscape and site design considerations as set forth in the Metro Air Park Landscape and Design Guidelines. The project site is located adjacent and east of Metro Air Park.

3.7.7 PANHANDLE

The Panhandle is an area of land located approximately 3 miles east of the project site in the unincorporated area of Sacramento County. The Panhandle site is bounded by Interstate 80 (I-80) to the south; Northgate Boulevard, Sorento Road, and East Levee Road to the east; Elkhorn Boulevard to the north; and Gateway Park Boulevard at the southwest corner. The Panhandle includes vacant land south of Elkhorn Road and north of Del Paso Road (approximately 595 acres) and approximately 853 acres south of Del Paso Road that is substantially built out with light industrial and office land uses. The Panhandle area is currently being considered for annexation.

The City is considering development applications for a mix of residential, commercial, park, open space, and school uses on the vacant parcels between Elkhorn Road and Del Paso Road.

3.7.8 NATOMAS BASIN HABITAT CONSERVATION PLAN

The Natomas Basin Habitat Conservation Plan (HCP) was adopted by the Sacramento City Council on August 17, 1997, and updated in 2003 and allows development to continue within the existing permit and while providing for the protection of the giant garter snake and Swainson's hawk and 24 other listed or candidate threatened or endangered species. The HCP covers the entire Natomas Basin area, which encompasses a total of 53,537 acres, with 11,387 acres within the City of Sacramento. The project site is located within the boundaries of the study area of the HCP. For additional details, please refer to Section 6.12, "Biological Resources."

6.2 AIR QUALITY

6.2.1 INTRODUCTION

This section includes a summary of applicable regulations, existing air quality conditions, and an analysis of potential short-term and long-term air quality impacts of the proposed project and alternatives. The method of analysis for short-term construction, long-term regional (operational), local mobile-source, odor, and toxic air emissions is consistent with the recommendations of the Sacramento Metropolitan Air Quality Management District (SMAQMD). In addition, mitigation measures are recommended, as necessary, to reduce significant air quality impacts.

6.2.2 ENVIRONMENTAL SETTING

The proposed project site is located in Sacramento County, California, which is within the Sacramento Valley Air Basin (SVAB). The SVAB also comprises all of Butte, Colusa, Glenn, Shasta, Sutter, Tehama, Yolo and Yuba Counties, the western portion of Placer County, and the eastern portion of Solano County. The ambient concentrations of air pollutant emissions are determined by the amount of emissions released by pollutant sources and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources, as discussed separately below.

TOPOGRAPHY, METEOROLOGY, AND CLIMATE

The SVAB is relatively flat, bordered by the North Coast Ranges to the west and the Northern Sierra Nevada mountains to the east. Air flows into the SVAB through the Carquinez Strait, the only breach in the western mountain barrier, and moves across the Sacramento–San Joaquin River Delta (Delta) from the San Francisco Bay area.

The Mediterranean climate type of the SVAB is characterized by hot, dry summers and cool, rainy winters. During the summer, daily temperatures range from 50°F to more than 100°F. The inland location and surrounding mountains shelter the area from much of the ocean breezes that keep the coastal regions moderate in temperature.

Most precipitation in the area results from air masses that move in from the Pacific Ocean, usually from the west or northwest during the winter months. More than half the total annual precipitation falls during the winter rainy season (November through February); the average winter temperature is a moderate 49°F. Also characteristic of SVAB winters are periods of dense and persistent low-level fog, which are most prevalent between storms. The prevailing winds are moderate in speed and vary from moisture-laden breezes from the south to dry land flows from the north.

The mountains surrounding the SVAB create a barrier to airflow, which leads to the entrapment of air pollutants when meteorological conditions are unfavorable for transport and dilution. The highest frequency of poor air movement occurs in the fall and winter when high-pressure cells are present over the SVAB. The lack of surface wind during these periods combined with the reduced vertical flow because of less surface heating reduces the influx of air and leads to the concentration of air pollutants under stable meteorological conditions. Surface concentrations of air pollutant emissions are highest when these conditions occur in combination with agricultural burning activities or temperature inversions, which hamper dispersion by creating a ceiling over the area and trapping air pollutants near the ground.

May through October is ozone season in the SVAB. This period is characterized by poor air movement in the mornings with the arrival of the Delta sea breeze from the southwest in the afternoons. In addition, longer daylight hours provide a plentiful amount of sunlight to fuel photochemical reactions between reactive organic

gases (ROG) and oxides of nitrogen (NO_x), which result in ozone formation. Typically, the Delta breeze transports air pollutants northward out of the SVAB; however, a phenomenon known as the Schultz Eddy prevents this from occurring during approximately half of the time from July to September. The Schultz Eddy phenomenon causes the wind pattern to shift southward resulting in air pollutants being blown back into the SVAB. This phenomenon exacerbates the concentration of air pollutant emissions in the area and contributes to violations of the ambient air quality standards.

Local meteorology of the proposed project site is represented by measurements recorded at the Sacramento station. The normal annual precipitation is approximately 18 inches. January temperatures range from a normal minimum of 38°F to a normal maximum of 53°F. July temperatures range from a normal minimum of 58°F to a normal maximum of 93°F (National Oceanic and Atmospheric Administration 1992). The predominant wind direction and speed is from the south-southwest at 10 mph (California Air Resources Board 1994).

Existing Air Quality—Criteria Air Pollutants

Concentrations of the following air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), respirable and fine particulate matter (PM₁₀ and PM_{2.5}), and lead are used as indicators of ambient air quality conditions. Because these are the most prevalent air pollutants known to be deleterious to human health and extensive health-effects criteria documents are available, they are commonly referred to as “criteria air pollutants.”

A brief description of each criteria air pollutant including source types, health effects, and future trends is provided below along with the most current attainment area designations and monitoring data for the project area.

Ozone

Ozone is a photochemical oxidant, a substance whose oxygen combines chemically with another substance in the presence of sunlight, and the primary component of smog. Ozone is not directly emitted into the air, but is formed through complex chemical reactions between precursor emissions of ROG and NO_x in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_x are a group of gaseous compounds of nitrogen and oxygen that results from the combustion of fuels.

Ozone located in the upper atmosphere (stratosphere) acts in a beneficial manner by shielding the earth from harmful ultraviolet radiation that is emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often affects large areas. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry (Godish 1991).

The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as asthmatics and children, but healthy adults as well. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 part per million (ppm) for 1 to 2 hours has been found to significantly alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing tidal volumes, and impairing respiratory mechanics. Ambient levels of ozone above 0.12 ppm are linked to symptomatic responses that include such symptoms as throat dryness, chest tightness, headache, and nausea. In addition to the above adverse health effects, evidence also exists relating ozone exposure to an increase in the permeability of respiratory epithelia; such increased permeability leads to an increase in responsiveness of the respiratory system to challenges, and the interference or inhibition of the immune system’s ability to defend against infection (Godish 1991).

Emissions of ozone precursors ROG and NO_x have decreased over the past several years because of more stringent motor vehicle standards and cleaner burning fuels. Consequently, peak 1-hour and 8-hour ozone concentrations in the SVAB have declined overall by about 15% since 1988. However, peak ozone values in the SVAB have not declined as rapidly over the last several years as they have in other urban areas. This can be attributed to influx of pollutants into the SVAB from other urbanized areas, making the region both a transport contributor and a receptor of pollutants (California Air Resources Board 2005a).

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile (transportation) sources. In fact, 77% of the nationwide CO emissions are from mobile sources. The other 23% consists of CO emissions from wood-burning stoves, incinerators, and industrial sources.

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (U.S. Environmental Protection Agency 2006).

The highest concentrations are generally associated with cold stagnant weather conditions that occur during the winter. In contrast to ozone, which tends to be a regional pollutant, CO problems tend to be localized.

Nitrogen Dioxide

Nitrogen dioxide (NO₂) is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO₂ are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO₂ (U.S. Environmental Protection Agency 2006). The combined emissions of NO and NO₂ are referred to as NO_x, which are reported as equivalent NO₂. Because NO₂ is formed and depleted by reactions associated with photochemical smog (ozone), the NO₂ concentration in a particular geographical area may not be representative of the local NO_x emission sources.

Inhalation is the most common route of exposure to NO₂. Because NO₂ has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including coughing, difficulty with breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately 4 to 12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO₂ intoxication after acute exposure has been linked on occasion with prolonged respiratory impairment with such symptoms as chronic bronchitis and decreased lung functions.

Sulfur Dioxide

Sulfur dioxide (SO₂) is produced by such stationary sources as coal and oil combustion, steel mills, refineries, pulp and paper mills. The major adverse health effects associated with SO₂ exposure pertain to the upper respiratory tract. SO₂ is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO₂ at 5 ppm or more. On contact with the moist mucous membranes, SO₂ produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO₂ concentrations may result in edema of the lungs or glottis and respiratory paralysis.

Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM₁₀. PM₁₀ consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulate matter formed in the atmosphere by condensation and/or transformation of SO₂ and ROG (U.S. Environmental Protection Agency 2006). Fine particulate matter (PM_{2.5}) includes a subgroup of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less (California Air Resources Board 2005a).

The adverse health effects associated with PM₁₀ depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons (PAH), and other toxic substances adsorbed onto fine particulate matter, which is referred to as the piggybacking effect, or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM₁₀ may result from both short-term and long-term exposure to elevated concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death (U.S. Environmental Protection Agency 2006). PM_{2.5} poses an increased health risk because the particles can deposit deep in the lungs and may contain substances that are particularly harmful to human health.

Direct emissions of both PM₁₀ and PM_{2.5} have increased in the SVAB between 1975 and 2000 and are projected to increase through 2020. These emissions are dominated by area-wide sources, primarily because of development. Direct emissions of PM from mobile and stationary sources have remained relatively steady (California Air Resources Board 2005a).

Lead

Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, as discussed in detail below, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the U.S. Environmental Protection Agency (EPA) set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. EPA banned the use of leaded gasoline in highway vehicles in December 1995 (U.S. Environmental Protection Agency 2006).

As a result of EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector have declined dramatically (95% between 1980 and 1999), and levels of lead in the air decreased by 94% between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13% of lead emissions. A recent National Health and Nutrition Examination Survey reported a 78% decrease in the levels of lead in people's blood between 1976 and 1991. This dramatic decline can be attributed to the move from leaded to unleaded (U.S. Environmental Protection Agency 2006).

The decrease in lead emissions and ambient lead concentrations over the past 25 years is California's most dramatic success story. The rapid decrease in lead concentrations can be attributed primarily to phasing out the lead in gasoline. This phase-out began during the 1970s, and subsequent California Air Resources Board (ARB) regulations have virtually eliminated all lead from gasoline now sold in California. All areas of the state are currently designated as attainment for the state lead standard (EPA does not designate areas for the national lead standard). Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, ARB identified lead as a toxic air contaminant.

Monitoring Station Data and Attainment Area Designations

Criteria air pollutant concentrations are measured at several monitoring stations in the SVAB. The Sacramento-Airport and T Street stations are the closest in proximity to the proposed project site with recent data for ozone, CO, PM₁₀, and PM_{2.5}. In general, the ambient air quality measurements from these stations are representative of the air quality in the vicinity of the proposed project site. Table 6.2-1 summarizes the air quality data from the most recent 3 years.

Both ARB and EPA use this type of monitoring data to designate areas according to attainment status for criteria air pollutants established by the agencies. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of the nonattainment designation, called nonattainment-transitional. The nonattainment-transitional designation is given to nonattainment areas that are progressing and nearing attainment. The most current attainment designations for the Sacramento County portion of the SVAB are shown in Table 6.2-2 for each criteria air pollutant.

Existing Air Quality—Toxic Air Contaminants

Concentrations of toxic air contaminants (TACs) are also used as indicators of ambient-air-quality conditions. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

According to the *California Almanac of Emissions and Air Quality* (California Air Resources Board 2005a), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being PM from diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory's PM₁₀ database, ambient PM₁₀ monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, *para*-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest existing ambient risk, for which data are available, in California.

Diesel PM poses the greatest health risk among these ten TACs mentioned. Based on receptor modeling techniques, ARB estimated its health risk to be 360 excess cancer cases per million people in the SVAB. Since 1990, the diesel PM's health risk has been reduced by 52%. Overall, levels of most TACs have gone down since 1990 except for *para*-dichlorobenzene and formaldehyde (California Air Resources Board 2005a).

**Table 6.2-1
Summary of Annual Ambient Air Quality Data (2003–2005)¹**

	2003	2004	2005
Ozone			
Maximum concentration (1-hr/8-hr, ppm)	0.097/ 0.085	0.090/ 0.072	0.100/ 0.087
Number of days state standard exceeded (1-hr)	2	0	4
Number of days national standard exceeded (1-hr/8-hr)	0/1	0/0	0/1
Carbon Monoxide (CO)			
Maximum concentration (1-hr/8-hr, ppm)	4.1/3.13	4.0/3.53	3.9/2.97
Number of days state standard exceeded (8-hr)	0	0	0
Number of days national standard exceeded (1-hr/8-hr)	0/0	0/0	0/0
Nitrogen Dioxide (NO₂)			
Maximum concentration (1-hr, ppm)	0.102	0.082	0.074
Number of days state standard exceeded (1-hr)	0	0	0
Annual Average (ppm)	0.018	0.015	0.015
Fine Particulate Matter (PM_{2.5})			
Maximum concentration (µg/m ³)	49.0	52.5	63.8
Number of days national standard exceeded (measured ²)	0	0	0
Respirable Particulate Matter (PM₁₀)			
Maximum concentration (µg/m ³)	123.0	87.1	99.8
Number of days state standard exceeded (measured/calculated ²)	-/28	0/12	6.4/19
Number of days national standard exceeded (measured/calculated ²)	-/0	0/0	-/0
<p>Notes: µg/m³ = micrograms per cubic meter; ppm = parts per million</p> <p>¹ Measurements from the Sacramento-Airport Road and T Street stations.</p> <p>² Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Measurements are typically collected every 6 days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.</p> <p>Sources: California Air Resources Board 2006, U.S. Environmental Protection Agency 2006</p>			

Table 6.2-2 Ambient Air Quality Standards and Designations						
Pollutant	Averaging Time	California		National Standards ¹		
		Standards ^{2,3}	Attainment Status ⁴	Primary ^{3,5}	Secondary ^{3,6}	Attainment Status ⁷
Ozone	1-hour	0.09 ppm (180 µg/m ³)	N(Serious)	0.12 ppm ⁹ (235 µg/m ³)	Same as Primary Standard	N(Severe) ⁹
	8-hour	0.07 ppm ⁸ (137 µg/m ³)	–	0.08 ppm (157 µg/m ³)		N(Serious)
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m ³)	A	35 ppm (40 mg/m ³)	–	U/A
	8-hour	9 ppm (10 mg/m ³)		9 ppm (10 mg/m ³)		
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	–	–	0.053 ppm (100 µg/m ³)	Same as Primary Standard	U/A
	1-hour	0.25 ppm (470 µg/m ³)	A	–		–
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	–	–	0.030 ppm (80 µg/m ³)	–	U
	24-hour	0.04 ppm (105 µg/m ³)	A	0.14 ppm (365 µg/m ³)	–	
	3-hour	–	–	–	0.5 ppm (1300 µg/m ³)	
	1-hour	0.25 ppm (655 µg/m ³)	A	–	–	
Respirable Particulate Matter (PM ₁₀)	Annual Arithmetic Mean	20 µg/m ³	N	50 µg/m ³	Same as Primary Standard	N(Moderate)
	24-hour	50 µg/m ³		150 µg/m ³		
Fine Particulate Matter (PM _{2.5})	Annual Arithmetic Mean	12 µg/m ³	N	15 µg/m ³	Same as Primary Standard	U
	24-hour	–	–	65 µg/m ³		
Lead ¹⁰	30-day Average	1.5 µg/m ³	U	–	–	–
	Calendar Quarter	–	–	1.5 µg/m ³	Same as Primary Standard	
Sulfates	24-hour	25 µg/m ³	A	No National Standards		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m ³)	U			
Vinyl Chloride ¹⁰	24-hour	0.01 ppm (26 µg/m ³)	U/A			

**Table 6.2-2 (Continued)
Ambient Air Quality Standards and Designations**

Visibility-Reducing Particle Matter	8-hour Extinction coefficient of 0.23 per kilometer — visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%.	U
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¹ National standards (other than ozone, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM₁₀ 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The PM_{2.5} 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact EPA for further clarification and current federal policies.

² California standards for ozone, CO (except Lake Tahoe), SO₂ (1- and 24-hour), NO₂, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

³ Concentration expressed first in units in which it was promulgated [i.e., parts per million (ppm) or micrograms per cubic meter (µg/m³)]. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

⁴ Unclassified (U): a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
 Attainment (A): a pollutant is designated attainment if the state standard for that pollutant was not violated at any site in the area during a 3-year period.
 Nonattainment (N): a pollutant is designated nonattainment if there was a least one violation of a state standard for that pollutant in the area.
 Nonattainment/Transitional (NT): is a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.

⁵ National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

⁶ National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

⁷ Nonattainment (N): any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.
 Attainment (A): any area that meets the national primary or secondary ambient air quality standard for the pollutant.
 Unclassifiable (U): any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

⁸ This concentration was approved by ARB on April 28, 2005, and is expected to become effective in early 2006.

⁹ The 1-hour ozone NAAQS was revoked on June 15, 2005.

¹⁰ ARB has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Source: California Air Resources Board 2006, U.S. Environmental Protection Agency 2006

6.2.3 REGULATORY SETTING

Air quality within Sacramento County is regulated by such agencies as EPA, ARB, and SMAQMD. Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, both state and local regulations may be more stringent.

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

At the federal level, EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments made by Congress were in 1990.

The CAA required EPA to establish national ambient air quality standards (NAAQS). As shown in Table 6.2-2, EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA has responsibility to review all state SIPs to determine conformance to the mandates of the CAA, and the amendments thereof, and determine if implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area that imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

State Plans, Policies, Regulations, and Laws

ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required ARB to establish California ambient air quality standards (CAAQS) (Table 6.2-2). ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and areawide emission sources, and provides districts with the authority to regulate indirect sources.

Other ARB responsibilities include, but are not limited to, overseeing local air district compliance with California and federal laws, approving local air quality plans, submitting SIPs to EPA, monitoring air quality, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

Local Plans, Policies, Regulations, and Laws

Sacramento Valley Air Quality Management District

SMAQMD seeks to improve air quality conditions in Sacramento County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of SMAQMD includes the preparation of plans and programs for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. SMAQMD also inspects stationary sources, responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements other programs and regulations required by the CAA, CAAA, and the CCAA.

In July 2004, SMAQMD released a revision to the previously adopted guidelines document. This revised *Guide to Air Quality Assessment* (SMAQMD 2004) is an advisory document that provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. The guide contains the following applicable components:

- ▶ criteria and thresholds for determining whether a project may have a significant adverse air quality impact;
- ▶ specific procedures and modeling protocols for quantifying and analyzing air quality impacts;
- ▶ methods available to mitigate air quality impacts; and
- ▶ information for use in air quality assessments that will be updated more frequently such as air quality data, regulatory setting, climate, and topography.

As mentioned above, SMAQMD adopts rules and regulations. All projects are subject to SMAQMD rules and regulations in effect at the time of construction. Specific rules applicable to the construction of the proposed project may include, but are not limited to:

- ▶ **Rule 201:** General Permit Requirements. Any project that includes the use of equipment capable of releasing emissions to the atmosphere may require permit(s) from SMAQMD before equipment operation. The applicant, developer, or operator of a project that includes an emergency generator, boiler, or heater should contact SMAQMD early to determine if a permit is required, and to begin the permit application process. Portable construction equipment (e.g., generators, compressors, pile drivers, lighting equipment) with an internal combustion engine over 50 horsepower (hp) are required to have a SMAQMD permit or ARB portable equipment registration.
- ▶ **Rule 403:** Fugitive Dust. The developer or contractor is required to control dust emissions from earth moving activities or any other construction activity to prevent airborne dust from leaving the project site.
- ▶ **Rule 442:** Architectural Coatings. The developer or contractor is required to use coatings that comply with the volatile organic compound (VOC) content limits specified in the rule.
- ▶ **Rule 902:** Asbestos. The developer or contractor is required to notify SMAQMD of any regulated renovation or demolition activity. Rule 902 contains specific requirements for surveying, notification, removal, and disposal of asbestos containing material.

In addition, effective as of October 10, 2005, if modeled construction-generated emissions for a project are not reduced to SMAQMD's threshold of significance (85 pounds per day [lb/day]) by the application of the standard construction mitigation, then an off-site construction mitigation fee is recommended. Payment of the fee is required before the issuance of a grading permit. This fee is used by SMAQMD to purchase off-site emissions reductions. This is done through SMAQMD's Heavy Duty Incentive Program, through which select owners of

heavy duty equipment in Sacramento County can repower or retrofit their old engines with cleaner engines or technologies.

Air Quality Plans

SMAQMD in coordination with the air quality management districts and air pollution control districts of El Dorado, Placer, Solano, Sutter, and Yolo Counties prepared and submitted the 1991 Air Quality Attainment Plan (AQAP) in compliance with the requirements set forth in the CCAA, which specifically addressed the nonattainment status for ozone and to a lesser extent, CO and PM₁₀. The CCAA also requires a triennial assessment of the extent of air quality improvements and emission reductions achieved through the use of control measures. As part of the assessment, the attainment plan must be reviewed and, if necessary, revised to correct for deficiencies in progress and to incorporate new data or projections. The requirement of the CCAA for a first triennial progress report and revision of the 1991 AQAP was fulfilled with the preparation and adoption of the 1994 Ozone Attainment Plan (OAP). The OAP stresses attainment of ozone standards and focuses on strategies for reducing ozone precursor emissions of ROG and NO_x. It promotes active public involvement, enforcement of compliance with SMAQMD rules and regulations, public education in both the public and private sectors, development and promotion of transportation and land use programs designed to reduce vehicle miles traveled (VMT) within the region, and implementation of stationary and mobile-source control measures. The OAP became part of the SIP in accordance with the requirements of the CAAA and amended the 1991 AQAP. However, at that time the region could not show that the national ozone (1-hour) standard would be met by 1999. In exchange for moving the deadline to 2005, the region accepted a designation of “severe nonattainment” coupled with additional emission requirements on stationary sources. Additional triennial reports were also prepared in 1997, 2000, and 2003 in compliance with the CCAA that act as incremental updates.

As a nonattainment area, the region is also required to submit rate-of-progress milestone evaluations in accordance with the CAAA. Milestone reports were prepared for 1996, 1999, and 2002. These milestone reports include compliance demonstrations that the requirements have been met for the Sacramento nonattainment area. The air quality attainment plans and reports present comprehensive strategies to reduce ROG, NO_x, and PM₁₀ emissions from stationary, area, mobile, and indirect sources. Such strategies include the adoption of rules and regulations; enhancement of California Environmental Quality Act (CEQA) participation; implementation of a new and modified indirect source review program; adoption of local air quality plans; and stationary-, mobile-, and indirect-source control measures.

In July of 1997, EPA promulgated a new 8-hour ozone standard. This change lowered the standard for ambient ozone from 0.12 ppm averaged over 1 hour to 0.08 ppm averaged over 8 hours. In general, the 8-hour standard is more protective of public health and more stringent than the 1-hour standard. The promulgation of this standard prompted new designations and nonattainment classifications in June 2004, and resulted in the revocation of the 1-hour standard in June 2005. The region has been designated as a nonattainment (serious) area for the national (8-hour) ozone standard with an attainment deadline of June 2013.

Although the region has made significant progress in reducing ozone, a problem has arisen with regard to another issue. The region’s transportation plan must conform and show that implementation will not harm the region’s chances of attaining the ozone standard. The SIP is tied to a “motor vehicle emissions budget” and thus, transportation planners must ensure that emissions anticipated from plans and improvement programs remain within this budget. The region is not required to update the SIP before the ozone (8-hour) plans are due in 2006. However, since a conformity lapse began October 4, 2004, an expedited process to prepare a plan is under way (SMAQMD 2006a).

City of Sacramento

The City of Sacramento General Plan does not have an adopted Air Quality Element and does not have any policies or goals directly related to air quality. However, other elements (e.g., transportation and housing) do contain goals, policies, and actions that refer to air quality where applicable in the context of the subject element.

LAFCo

The LAFCo Policies, Procedures, and Guidelines document does not contain any policies related to air quality.

Toxic Air Contaminants

Air quality regulations also focus on TACs, or in federal parlance hazardous air pollutants (HAPs). In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This contrasts with the criteria air pollutants, for which acceptable levels of exposure can be determined and for which the ambient standards have been established (Table 6.2-2). Instead, EPA and ARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology for toxics (MACT and BACT) to limit emissions. These in conjunction with additional rules set forth by ARB (for mobile sources) and SMAQMD establish the regulatory framework for TACs.

Federal Hazardous Air Pollutant Programs

EPA has programs for identifying and regulating HAPs. Title III of the CAAA directed EPA to promulgate national emissions standards for HAPs (NESHAP). The NESHAP may differ for major sources than for area sources of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (TPY) of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources. The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring MACT. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), EPA is required to promulgate health risk–based emissions standards where deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards.

The CAAA also required EPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.

State and Local Toxic Air Contaminant Programs

TACs in California are primarily regulated through the Tanner Air Toxics Act (Assembly Bill [AB] 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). AB 1807 sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs, and adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the ARB list of TACs.

Once a TAC is identified, ARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

ARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). In February 2000, ARB adopted a new public-transit bus fleet rule and emission standards for new urban buses. These new rules and standards provide for (1) more stringent emission standards for some new urban bus engines beginning with 2002 model year engines; (2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and (3) reporting requirements with which transit agencies must demonstrate compliance with the urban transit bus fleet rule. Upcoming milestones include the low-sulfur diesel fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide. Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially less TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, diesel PM) have been reduced significantly over the last decade, and will be reduced further in California through a progression of regulatory measures [e.g., Low Emission Vehicle (LEV)/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of ARB's Risk Reduction Plan, it is expected that diesel PM concentrations will be reduced by 75% in 2010 and 85% in 2020 from the estimated year 2000 level. Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

ARB recently published the *Air Quality and Land Use Handbook: A Community Health Perspective*, which provides guidance concerning land use compatibility with TAC sources (California Air Resources Board 2005b). While not a law or adopted policy, the handbook offers advisory recommendations for the siting of sensitive receptors near uses associated with TACs such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries dry cleaners, gasoline stations, and industrial facilities to help keep children and other sensitive populations out of harm's way. A number of comments on the Handbook were provided to ARB by air districts, other agencies, real estate representatives, and others. The comments included concern over whether ARB was playing a role in local land use planning, the validity of relying on static air quality conditions over the next several decades in light of technological improvements, and support for providing information that can be used in local decision making.

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. Under SMAQMD Rule 201 (General Permit Requirements), Rule 202 (New Source Review), and Rule 207 (Federal Operating Permit), all sources that possess the potential to emit TACs are required to obtain permits from the district. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. SMAQMD limits emissions and public exposure to TACs through a number of programs. SMAQMD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors. SMAQMD is also currently developing guidelines for implementation of ARB's *Air Quality and Land Use Handbook* (Maertz, pers. comm., 2006).

Sources that require a permit are analyzed by SMAQMD (e.g., health risk assessment) based on their potential to emit toxics. If it is determined that the project would emit toxics in excess of SMAQMD's threshold of significance for TACs, as identified below, sources have to implement the best available control technology for TACs (T-BACT) in order to reduce emissions. If a source cannot reduce the risk below the threshold of significance even after T-BACT has been implemented, SMAQMD will deny the permit required by the source. This helps to prevent new problems and reduces emissions from existing older sources by requiring them to apply new technology when retrofitting with respect to TACs. It is important to note that SMAQMD's air quality permitting process applies to stationary sources; properties that are exposed to elevated levels of nonstationary type sources of TACs, and the nonstationary type sources themselves (e.g., on-road vehicles) are not subject to air

quality permits. Further, due to feasibility and practicality reasons, mobile sources (cars, trucks, etc.) are not required to implement T-BACT on a project-specific basis, even if they do have the potential to expose adjacent properties to elevated levels of TACs. Rather, emissions controls on such sources (e.g., vehicles) are subject to regulations implemented on the state and federal level. This regulatory program constitutes programmatic mitigation for these sources.

6.2.4 IMPACTS AND MITIGATION MEASURES

METHOD OF ANALYSIS

Short-term construction-generated criteria air pollutant (e.g., PM_{10}) and ozone precursor emissions (ROG and NO_x) were assessed in accordance with SMAQMD-recommended methods. Where quantification is required, emissions were modeled using the URBEMIS 2002 Version 8.7 computer model, and other emission factors and recommended methodologies from SMAQMD's *Guide to Air Quality Assessment* (SMAQMD 2004). Modeling was based on project-specific data (e.g., estimated duration of construction, size and type of proposed land uses); URBEMIS default settings for the SVAB; and SMAQMD-recommended construction equipment types and number requirements, and maximum daily acreage disturbed. Predicted short-term construction-generated emissions were compared with applicable SMAQMD thresholds for determination of significance.

It is important to note that according to SMAQMD, short-term construction-generated ROG emissions should be modeled; however, SMAQMD does not have a threshold of significance to compare with such emissions. Thus, in accordance with SMAQMD-recommended methodologies, short-term construction-generated ROG emissions resulting from implementation of the proposed project are modeled and shown for informational purposes, but no determination of significance is based on such emissions. SMAQMD bases this approach on the fact that ROG emissions attributable to construction equipment exhaust are low and those from the application of architectural coatings are regulated by Rule 442 (Christensen, pers. comm., 2005). For purposes of the environmental impact report (EIR), determinations of significance for short-term construction emissions were based on the comparison of project-generated NO_x and PM_{10} to SMAQMD thresholds, as recommended by SMAQMD. (SMAQMD 2004; Christensen, pers. comm., 2005.)

Long-term (i.e., operational) regional criteria air pollutant and precursor emissions, including mobile- and area-source emissions, were also quantified using the URBEMIS 2002 Version 8.7 computer model. Modeling was based on project-specific data (e.g., size and type of proposed uses), URBEMIS default settings for the SVAB, and trip generation data from the traffic analysis. Long-term stationary source emissions were qualitatively assessed in accordance with SMAQMD-recommended methodologies. Predicted long-term operational emissions were compared with applicable SMAQMD thresholds for determination of significance.

All other air quality impacts (i.e., local mobile-source, odor, and TAC emissions) were assessed in accordance with ARB and SMAQMD-recommended methodologies. Such methodologies include the use of SMAQMD's screening level procedure for local mobile-source CO concentrations, and a qualitative assessment for the exposure of sensitive receptors to odor or TAC emissions.

THRESHOLDS OF SIGNIFICANCE

For the purpose of this analysis, the following thresholds of significance, as identified by the State CEQA Guidelines (Appendix G) and SMAQMD, have been used to determine whether implementation of the proposed project would result in significant air quality impacts. Based on Appendix G of the State CEQA Guidelines, an air quality impact is considered significant if implementation of the proposed project under consideration would do any of the following:

- ▶ conflict with or obstruct implementation of the applicable air quality plan,

- ▶ violate any air quality standard or contribute substantially to an existing or projected air quality violation,
- ▶ result in a cumulatively considerable net increase of any criteria air pollutant for which the project region is nonattainment under any applicable national or state ambient air quality standards (including releasing emissions that exceed quantitative thresholds for ozone precursors),
- ▶ expose sensitive receptors to substantial pollutant concentrations, or
- ▶ create objectionable odors affecting a substantial number of people.

As stated in Appendix G, the significance of criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. Thus, as contained in SMAQMD's *Guide to Air Quality Assessment*, implementation of the proposed project would result in significant air quality impacts if any of the following would occur:

- ▶ construction-generated emissions of NO_x would exceed the SMAQMD-recommended mass emissions threshold of 85 lb/day;
- ▶ construction-generated criteria air pollutant or precursor emissions would result in or substantially contribute to emissions concentrations that exceed the CAAQS (e.g., 50 µg/m³ [24-hour] for PM₁₀). According to SMAQMD, a project is considered to contribute substantially to an existing or projected violation of the CAAQS if it emits pollutants at a level equal to or greater than 5% of the CAAQS (e.g., 2.5 µg/m³ [24-hour] for PM₁₀);
- ▶ long-term operational (regional) emissions of ROG or NO_x would exceed the SMAQMD-recommended mass emissions threshold of 65 lb/day;
- ▶ long-term operational (regional) criteria air pollutant or precursor emissions would result in or substantially contribute to emissions concentrations that exceed the CAAQS. According to SMAQMD, a project is considered to contribute substantially to an existing or projected violation of the CAAQS if it emits pollutants at a level equal to or greater than 5% of the CAAQS;
- ▶ long-term operational local mobile-source emissions would result in emissions concentrations of CO that exceed the 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm; or
- ▶ sensitive receptors would be exposed to excessive odor emissions, as defined under the California Code of Regulations, Health and Safety Code Section 41700, Air Quality Public Nuisance.

No significance thresholds have been established by SMAQMD for exposure of sensitive receptors to mobile-source TAC emissions (Maertz, pers. comm., 2006). However, for purposes of this EIR, exposure to off-site, mobile source TAC emissions would be significant if:

- ▶ on-site sensitive receptors would be exposed to substantial increased health risks.

There are no universally accepted standards to define substantial increases in health risks. The most common standard, which generally applies to exposure to stationary sources (such as industrial smokestacks), is an incremental increase in cancer risk of 10 or more in 1 million, or an incremental hazard index of 1.0 or greater.

Long-term exposure to freeway-related emissions (e.g., diesel PM) presents both noncancer (acute and chronic) and cancer risk. Although the stationary-source standard provides one possible metric for assessing risk, it has not typically been applied to freeways or to developments located near freeways. However, there is no known technical reason for not applying this standard to mobile source exposure from freeway emissions. If this standard were to be applied, the cancer risk level would be considered significant if one additional person in 100,000 (i.e.,

10 in 1,000,000) would develop cancer over a 70-year exposure period, as compared to baseline exposure levels. The level of noncancer (acute and nonchronic) risk is based on a hazard index and is calculated by dividing the modeled annual average to which persons in the proposed project area would be exposed by the Reference Exposure Level (REL) for the TAC of concern (e.g., diesel PM). The REL is the concentration at or below which no adverse health effects would be anticipated. Thus, a hazard index greater than 1.0 signifies a health risk. The baseline exposure level is a statistical estimate based on average exposure levels throughout the Sacramento region¹.

Although SMAQMD has not adopted significance thresholds pertaining to mobile TAC exposure, a survey of various air districts in California found at least one district that has adopted one: the San Joaquin Valley Air Pollution Control District (SJVAPCD), which covers the San Joaquin Valley. SJVAPCD (mobile and stationary) thresholds of significance for TACs are a maximum incremental cancer risk equal to or greater than 10 in 1 million or a hazard index of equal to or greater than 1.0. Additionally, the South Coast Air Quality Management District (SCAQMD), which is the air pollution control agency for all of Orange County and the urban portions of Los Angeles, Riverside, and San Bernardino Counties, includes a table (last revised October 2006) with air quality significance thresholds in its CEQA Handbook. The handbook is undergoing revision, and the chapter that describes applicability of the thresholds table is not yet available. The table includes the same criteria for significance (hazard index of 1.0 or greater; maximum incremental cancer risk of 10 in 1 million or greater) as used by SJVAPCD, without reference to whether it applies to only stationary or both mobile and stationary sources.

The standard used by SJVAPCD and SCAQMD is a reasonably protective standard for consideration of public health, whether it is intended to be applied to stationary- or mobile-source exposure, and is therefore used in this EIR.

Construction-related air quality impacts associated with construction of wastewater treatment facilities are discussed in Section 6.4, "Utilities."

IMPACTS AND MITIGATION MEASURES

IMPACT
6.2-1

*Short Term Construction-Generated Emissions. Construction-generated emissions of NO_x would exceed SMAQMD's significance threshold of 85 lb/day, and because of the project's size, PM₁₀ emissions would result in or substantially contribute to emission concentrations that exceed the CAAQS. In addition, because Sacramento County is currently designated as a nonattainment area for both ozone and PM₁₀, construction-generated emissions could further contribute to pollutant concentrations that exceed the CAAQS. This impact would be **significant**.*

Construction emissions are described as "short term" or temporary in duration and have the potential to represent a significant impact with respect to air quality. Construction of the proposed project is anticipated to begin in 2007 and would last approximately 5–10 years. Initial site preparation (i.e., clearing, grubbing, grading) of the entire project site would occur first before the building of the proposed uses, which would occur in two phases. Phase 1 of building construction would include the development of land north of Meister Way and Phase 2 would develop land south of Meister Way. Construction of the proposed project would temporarily generate emissions of ozone precursor pollutants (i.e., ROG and NO_x) and fugitive dust emissions (including PM₁₀), as discussed separately below, from employee commute trips, diesel mobile equipment, material transport, and other construction operations, such as asphalt paving and the application of architectural coatings.

¹ In developing a baseline for analysis, it is presumed that people who would reside at the project site would otherwise reside elsewhere in the project region. Thus, the baseline represents the general existing air quality conditions in Sacramento.

Ozone Precursor Emissions (ROG and NO_x)

Emissions of ozone precursor pollutants are primarily associated with construction equipment exhaust. Employee commute trips and other construction activities (e.g., asphalt paving and the application of architectural coatings) also contribute to short-term increases in emissions but to a much lesser extent.

Short-term construction emissions of ROG and NO_x were estimated using the ARB-approved URBEMIS 2002 Version 8.7 computer program as recommended by SMAQMD (SMAQMD 2004). URBEMIS is designed to model construction emissions for land use development projects and allows for the input of project-specific information. Detailed construction information (e.g., equipment requirements, type, hours of operation, number of employees) was not available at the time this analysis was conducted. As a result, the estimation of construction-generated emissions was based primarily on the default assumptions contained in the model for the size and location (i.e., within the SVAB) of the proposed project. Model parameters were adjusted to reflect the overall construction phasing schedule, as well as equipment assumptions recommended by SMAQMD for site preparation and building activities. The estimated daily construction-generated emissions of ROG and NO_x attributable to the proposed project are summarized in Table 6.2-3. Refer to Appendix D for model output files and assumptions.

As discussed above, SMAQMD has not established a threshold of significance with respect to construction-generated ROG emissions because those attributable to construction equipment exhaust are low and those from the application of architectural coatings are regulated by Rule 442 (Christensen, pers. comm., 2005); however, SMAQMD has adopted a threshold of 85 lb/day for NO_x (SMAQMD 2004). Thus, as depicted in Table 6.2-3, the initial site preparation phase of construction would generate maximum daily emissions of approximately 638.7 lb/day of NO_x. Subsequent development phases (i.e., building construction of phases 1 and 2) would generate maximum daily emissions of approximately 357.9 lb/day and 297.0 lb/day of NO_x, respectively. Modeled emissions of NO_x, during all phases of construction (i.e., initial site preparation phase and building construction of phases 1 and 2), would exceed SMAQMD's significance threshold of 85 lb/day. In addition, because Sacramento County is currently designated as a nonattainment area for ozone and PM₁₀, construction-generated emissions could further contribute to pollutant concentrations that exceed the CAAQS.

PM₁₀ Emissions

Fugitive dust emissions, including PM₁₀, are associated primarily with ground disturbance activities during site preparation and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and VMT on- and off-site. Exhaust emissions from employee commute trips and diesel mobile construction equipment also contribute to short-term increases in PM₁₀ emissions but to a much lesser extent.

With respect to PM₁₀ emissions, SMAQMD has also developed screening-level values related to the maximum actively disturbed area of the project site. According to these values, if more than 15 acres would be actively disturbed, even with the implementation of the recommended mitigation measures, project construction would likely result in potentially significant emissions. Consequently, because of the large size of the project coupled with the lack of available detailed construction information, SMAQMD has recommended that concentration of PM₁₀ emissions be qualitatively discussed rather than modeled and that all SMAQMD-recommended mitigation measures be incorporated (Tholen, pers. comm., 2004). Thus, because of the project's size (577 acres) and the maximum actively disturbed area would exceed SMAQMD's screening level of 15

acres on any given day, short-term construction-generated PM₁₀ emissions would result in or substantially contribute to emissions concentrations that exceed the CAAQS.

In summary, modeled emissions of NO_x, during all phases of construction, would exceed SMAQMD's significance threshold of 85 lb/day and, because of the project's size, short-term construction-generated PM₁₀ emissions would result in or substantially contribute to emissions concentrations that exceed the CAAQS. In addition, because Sacramento County is currently designated as a nonattainment area for ozone and PM₁₀, construction-generated emissions could further contribute to pollutant concentrations that exceed the CAAQS. As a result, this impact would be significant.

**Table 6.2-3
Summary of Modeled Worst-Case Daily Short-Term Construction-Generated Emissions**

Source	Emissions (lb/day)	
	ROG	NO _x
Initial Site Preparation Phase (Beginning Spring 2007)		
Diesel Mobile Equipment Exhaust ¹	92.9	637.3
Employee Trips	1.2	1.4
Total Unmitigated (Site Preparation)	94.1	638.7
Total Mitigated (Site Preparation) ²	89.5	511.2
Building Construction Phase 1-North of Meister Way (Beginning 2007)		
Diesel Mobile Equipment Exhaust ¹	52.0	330.9
Employee Trips	21.2	27.0
Architectural Coating ³	-	-
Asphalt Off-Gas ⁴	6.1	-
Total Unmitigated (Phase 1)	79.3	357.9
Total Mitigated (Phase 1) ²	76.7	291.7
Building Construction Phase 2-South of Meister Way (Beginning 2009)		
Diesel Mobile Equipment Exhaust ¹	43.8	279.2
Employee Trips	14.5	17.8
Architectural Coating ³	-	-
Asphalt Off-Gas ⁴	4.5	-
Total Unmitigated (Phase 2)	62.8	297.0
Total Mitigated (Phase 2) ²	60.6	241.2
Maximum Daily Emissions Unmitigated All Phases	94.1	638.7
Maximum Daily Emissions Mitigated All Phases ²	89.5	511.2
SMAQMD Significance Threshold:	None	85
¹ Based on default model settings, and SMAQMD-recommended equipment types and number requirements and maximum daily acreage disturbed. ² Reductions based on SMAQMD-recommended construction mitigation measures. ³ As recommended by SMAQMD, architectural coating emissions are not included in the analysis ⁴ Includes off-gas emissions from the application of asphalt during paving activities. Refer to Appendix D for additional assumptions and modeling output files. Source: Data modeled by EDAW in 2006		

Mitigation Measure 6.2-1: (City of Sacramento and LAFCo)

In accordance with the recommendations of SMAQMD, the project applicant shall implement the following measures to reduce temporary construction emissions.

- a. The project applicant shall implement the following measures to reduce NO_x and visible emissions from heavy-duty diesel equipment.
 - i. Before issuance of a grading permit, the project applicant shall provide a plan for approval by the lead agency, in consultation with SMAQMD, demonstrating that the heavy-duty (>50 hp), off-road vehicles to be used in the construction project, including owned, leased, and subcontractor vehicles, will achieve a projectwide fleet-average 20% NO_x reduction and 45% particulate reduction compared to the most recent ARB fleet average at the time of construction. Acceptable options for reducing emissions include the use of late-model engines, low-emission diesel products, alternative fuels, particulate matter traps, engine retrofit technology, after-treatment products, and/or such other options as become available.
 - ii. Before issuance of a grading permit, the project applicant shall submit to the lead agency and SMAQMD a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 hp, that will be used an aggregate of 40 or more hours during any portion of project construction. The inventory shall be updated and submitted monthly throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction operations occur. At least 48 hours before heavy-duty off-road equipment is used, the project applicant shall provide SMAQMD with the anticipated construction timeline including start date, and the name and phone number of the project manager and on-site foreman.
 - iii. Before issuance of a grading permit, the project applicant shall ensure that emissions from off-road, diesel-powered equipment used on the project site do not exceed 40% opacity for more than 3 minutes in any 1 hour. Any equipment found to exceed 40% opacity (for white smoke) or Ringlemann 2.0 (for black smoke) shall be repaired immediately, and SMAQMD shall be notified of noncompliant equipment within 48 hours of identification. A visual survey of all in-operation equipment shall be made at least weekly by the construction contractor, and the contractor shall submit a monthly summary of visual survey results throughout the duration of the construction project, except that the monthly summary shall not be required for any 30-day period in which no construction operations occur. The monthly summary shall include the quantity and type of vehicles surveyed, as well as the dates of each survey. SMAQMD and/or other officials may conduct periodic site inspections to determine compliance.
- b. As recommended by SMAQMD, the project applicant shall reduce fugitive dust emissions by implementing the measures listed below during construction.
 - i. All disturbed areas, including storage piles that are not being actively used for construction purposes, shall be effectively stabilized of dust emissions using water, a chemical stabilizer or suppressant, or vegetative ground cover. Soil shall be kept moist at all times.
 - ii. All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or a chemical stabilizer or suppressant.
 - iii. When materials are transported off-site (e.g., trees, plantings), all material shall be covered, effectively wetted to limit visible dust emissions, or maintained with at least 2 feet of freeboard space from the top of the container.
 - iv. All operations shall limit or expeditiously remove the accumulation of project-generated mud or dirt from adjacent public streets at least once every 24 hours when operations are occurring.
 - v. After materials are added to or removed from the surfaces of outdoor storage piles, the storage piles shall be effectively stabilized of fugitive dust emissions using sufficient water or a chemical stabilizer or suppressant.

- vi. On-site vehicle speeds on unpaved roads shall be limited to 15 mph.
 - vii. Wheel washers shall be installed for all trucks and equipment exiting unpaved areas, or wheels shall be washed to remove accumulated dirt before such vehicles leave the site.
 - viii. Sandbags or straw waddles shall be installed to prevent silt runoff to public roadways from adjacent project areas with a slope greater than 1 %.
 - ix. Excavation and grading activities shall be suspended when winds exceed 20 mph.
 - x. The extent of areas simultaneously subject to excavation and grading shall be limited, wherever possible, to the minimum area feasible.
 - xi. Emulsified diesel, diesel catalysts, or SMAQMD-approved equal, shall be used on applicable heavy-duty construction equipment that can be operated effectively and safely with the alternative fuel type.
- c. The applicant shall pay \$1,525,537 into SMAQMD’s off-site construction mitigation fund to further mitigate construction-generated emissions of NO_x that exceed SMAQMD’s daily emission threshold of 85 lb/day. The calculation of daily NO_x emissions is based on the current cost of \$14,300 to reduce a ton of NO_x. The determination of the final mitigation fee shall be conducted in coordination with SMAQMD. The fee shall be paid to SMAQMD prior to any ground disturbance in total or on an acre bases (~~\$5,959.13~~ \$2,643.91/acre²) as development occurs and permits are sought. (See Appendix D for calculation worksheet.)
- d. In addition to the measures identified above, construction operations are required to comply with all applicable SMAQMD rules and regulations.

Significance After Mitigation

Implementation of the measures under part A above would result in a 20% reduction in NO_x emissions and a 45% reduction in visible emissions from heavy-duty diesel equipment according to SMAQMD. Implementation of the measures under part (b) would reduce fugitive dust emissions by up to 75%, according to estimates provided by SMAQMD. Daily construction emissions would still exceed SMAQMD’s significance threshold (Table 6.2-3) despite implementation of all feasible mitigation measures, and thus would potentially result in or substantially contribute to pollutant concentrations that exceed the CAAQS. As a result, this would be considered a **significant and unavoidable** impact.

**IMPACT
6.2-2**

*Generation of Long-Term Operational (Regional) Emissions of ROG, NO_x, and PM₁₀. Long-term operation of the proposed project would result in emissions of ozone-precursor pollutants that would exceed SMAQMD’s threshold. Furthermore, the project’s operational emissions would potentially conflict with or obstruct implementation of applicable air quality plans. As a result, this impact would be considered **significant**.*

Regional area- and mobile-source emissions of ROG, NO_x, and PM₁₀ associated with implementation of the proposed project were estimated using URBEMIS 2002 Version 8.7.0 computer program, which is designed to model emissions for land use development projects. URBEMIS allows land use selections that include project location specifics and trip generation rates. URBEMIS accounts for area emissions from the usage of natural gas, wood stoves, fireplaces, landscape maintenance equipment, and consumer products; and mobile-source emissions associated with trip generation. Regional area and mobile-source emissions were estimated based on proposed land uses identified in the phasing plan and trip generation rates obtained from the transportation analysis prepared for this project, Section 6.1, “Transportation and Circulation.” The estimation of mobile-source emissions includes a pass-by trip adjustment, which accounts for trips made as intermediate stops on the way from an origin to a primary trip

² The original calculation included in the Draft EIR erroneously allocated the total fee over only part of the site. this has been corrected to allocate the fee over the entire site.

destination, and a double-counting trip adjustment, which is designed to reduce double counting of internal trips between residential and nonresidential land uses.

Operational emissions are summarized in Table 6.2-4. During the summer months, buildout of the proposed project would generate operational emissions of approximately 418.3 lb/day of ROG, 266.1 lb/day of NO_x, and 241.1 lb/day of PM₁₀. Operational emissions would increase substantially during the winter months because of emissions generated by residential-use wood-burning fireplaces. Estimated operational emissions during the winter months would be approximately 2,382.1 lb/day of ROG, 438.3 lb/day of NO_x, and 778.2 lb/day of PM₁₀.

Long-term operation of the proposed project would result in emissions of ROG and NO_x in excess of SMAQMD's corresponding thresholds of 65 lb/day. Furthermore, operation of the project would result in increased vehicle trips and VMT compared to existing conditions that are not already accounted for in an approved plan. An increase in VMT and associated mobile-source emissions, may conflict with SMAQMD's air quality planning efforts. Consequently, an increase in VMT beyond projections in local plans would potentially result in a significant adverse incremental effect on the region's ability to attain and/or maintain the CAAQS. This would be a *significant* impact.

Table 6.2-4 Summary of Modeled Daily Long-Term Operational Emissions			
Source	Emissions (lb/day) ¹		
	ROG	NO _x	PM ₁₀
Summer			
Motor Vehicles	233.4	216.9	240.7
Landscape Maintenance	11.3	1.5	0.3
Natural Gas Usage	3.7	47.7	0.1
Consumer Products	169.9	--	--
Wood-Burning Fireplace	No Summer Emissions		
Total Unmitigated	418.3	266.1	241.1
Total Mitigated	355.5	226.2	204.9
Winter			
Motor Vehicles	237.4	323.3	240.7
Landscape Maintenance	No Winter Emissions		
Natural Gas Usage	3.7	47.7	0.1
Consumer Products	169.9	--	--
Wood-Burning Fireplace	1,971.1	67.3	537.4
Total Unmitigated	2,382.1	438.3	778.2
Total Mitigated	350.7	338.5	206.6
SMAQMD Significance Threshold:	65	65	-
¹ Emissions modeled using the Urbemis2002 (v8.7) computer model, based on trip generation rates obtained from the transportation analysis prepared for this project and proposed land uses identified in the project phasing plan. Refer to Appendix D for additional assumptions and modeling output files. Source: Data modeled by EDAW in 2006			

Mitigation Measure 6.2-2: (City of Sacramento and LAFCo)

When a proposed project's operational emissions are estimated to exceed SMAQMD's threshold of significance of 65 lb/day for ROG or NO_x, an Air Quality Mitigation Plan (Appendix E) to reduce operational emissions by a minimum of 15% shall be submitted to SMAQMD for approval. The following mitigation has been chosen from SMAQMD's most current recommended land use reduction measure and shall be incorporated to achieve a 15% reduction.

- a. Nonresidential land uses shall provide bicycle lockers and/or racks (commercial).
- b. Nonresidential land uses shall provide personal showers and lockers for employees (commercial).
- c. Bicycle storage (Class I) shall be provided at apartment complexes or condos without garages (residential).
- d. The entire project shall be located within ½ mile of a Class I or Class II bike lane and provide a comparable bikeway connection to that existing facility (residential, commercial, mixed).
- e. The project shall provide for pedestrian facilities and improvements such as overpasses and wider sidewalks (e.g., 5-foot) (residential, commercial, mixed).
- f. Preferential parking shall be provided for carpools/vanpools (commercial).
- g. High density residential, mixed, or retail/commercial uses shall be within 1/4 mile of planned light rail, linking with activity centers and other planned infrastructure (residential, commercial, mixed).
- h. Parking lot design shall include clearly marked and shaded pedestrian pathways between transit facilities and building entrances (commercial).
- i. Setback distance shall be minimized between development and planned transit, bicycle, or pedestrian corridor (commercial, mixed).
- j. Neighborhoods shall serve as focal points with parks, school and civic uses within 1/4 mile (residential, mixed).
- k. Separate, safe, and convenient bicycle and pedestrian paths shall connect residential, commercial, and office uses (residential, commercial, mixed).
- l. The project shall provide a development pattern that eliminates physical barriers such as walls, berms, landscaping, and slopes between residential and nonresidential uses that impede bicycle or pedestrian circulation (commercial, mixed).
- m. Wood-burning fireplaces shall be prohibited, and if natural-gas fireplaces are installed, they shall be the lowest emitting commercially available (residential).
- n. The lowest emitting commercially available furnaces shall be installed (residential, commercial, mixed).
- o. Ozone destruction catalyst shall be installed on air conditioning systems in consultation with SMAQMD (residential, commercial, mixed).
- p. Loading and unloading facilities shall be provided for transit and carpool/vanpool users (commercial).
- q. Average residential density shall be seven dwelling units per acre or greater (residential).

- r. The project shall be mixed-use and consist of at least three of the following on-site and/or within 1/4 mile: residential development, retail development, personal services, open space, and office space (mixed).

Although the above mitigation measures would substantially reduce the project’s operational emissions, they would not reduce the project’s operational emissions below SMAQMD’s significance thresholds (refer to Table 6.2-4). As a result, this impact would be *significant and unavoidable*.

**IMPACT
6.2-3**

Generation of Local Mobile-Source CO Emissions. Implementation of the proposed project would not contribute to localized mobile-source CO concentrations that exceed the 1-hour or 8-hour CAAQS of 20 ppm and 9.0 ppm, respectively. Therefore, this impact would be less than significant.

CO concentration is a direct function of motor vehicle activity, particularly during peak commute hours, and meteorological conditions. Under specific meteorological conditions, CO concentrations may reach unhealthy levels with respect to local sensitive land-uses such as residential areas, schools, and hospitals. As a result, SMAQMD recommends analysis of CO emissions at a local rather than a regional level.

The recent guidelines from SMAQMD (SMAQMD 2004) provide a project-level screening procedure to determine whether detailed intersection-level modeling is required. The screening procedure conservatively estimates the background CO concentration in the project area and the project’s contribution to predicted future concentrations, based on an estimation of peak hour vehicle trips. The project’s contributions to local CO concentrations were estimated for interim Phase 1 completion and buildout conditions. Predicted CO concentrations are presented in Table 6.2-5.

Based on the modeling conducted, the predicted local mobile-source CO concentrations would not exceed the 1-hour or 8-hour CAAQS (i.e., 20 ppm and 9.0 ppm, respectively). As a result, this impact would be *less than significant*.

No mitigation measures are required.

Table 6.2-5 Predicted Local Mobile-Source Carbon Monoxide Concentrations				
	CO Concentration (ppm)			
	Phase 1		Buildout - Phase 1 & 2	
	1-hour	8-hour	1-hour	8-hour
Background Concentration ¹	3.06	1.53	2.64	1.32
Project Contribution	3.10	2.17	9.2	6.5
Predicted Total Concentration ²	6.16	3.70	11.84	7.8
California Ambient Air Quality Standard	20.0	9.0	20.0	9.0
¹ The SMAQMD CO screening methodology does not identify corresponding background concentrations for buildout year 2012. To ensure a conservative analysis, the background concentration for buildout conditions are based on SMAQMD-recommended year 2010 concentrations. This is a conservative approach because background concentrations for the buildout year of 2012 would actually be lower due to more stringent vehicle emission control standards. ² Predicted CO concentrations are the sums of a background component, which includes the cumulative effects of all CO sources in the project area vicinity, and the proposed project’s contribution. Refer to Appendix D for CO screening analysis modeling. Source: EDAW 2005				

Exposure of Sensitive Receptors to Toxic Air Contaminant Emissions. Implementation of the proposed project could result in the exposure of existing sensitive receptors to minor increases in short-term construction emissions and future residents to TAC emissions from: airport operations; vehicle emissions closest to I-5 and SR 70/99; to mobile-source TAC emissions that elevate their health risks compared to other areas on the site and in the Sacramento region in general; There are no accepted or prescribed thresholds for exposure to the impacts of TAC emissions from mobile sources; and TACs from on-site commercial and other activities. Consequently, although there is a potential that exposure to mobile sources along the margins of the site closest to the freeways would result in elevated health risk compared with other areas of the site, an accurate quantifiable risk is not possible.

Exposure to short-term construction emissions would be temporary and would not result in substantial health hazards; the impact would be less than significant.

Exposure to TACs from airport operations is an issue that is being studied on a national level, but no conclusions have been reached as to whether such exposure would be a health hazard. No conclusion on its significance can be reached in this EIR. Any conclusion would be speculative.

An analysis using both screening criteria and calculations of incremental risk to residents from exposure to TACs for residents along the margins closest to the freeways shows that the project would not result in substantial increased health risk. Further, in view of the ongoing state and federal regulatory programs that have demonstrated significant reductions in health risks from toxic air contaminants in the Sacramento area (as well as throughout the state), and forecasted future improvements as a result of continued implementation of these existing regulatory programs, this impact would be less than significant.

Given that proposed on-site commercial land uses have not yet been identified, and given the potential proximity of nearby sensitive receptors, exposure of nearby on-site receptors to mobile-source TACs associated with commercial and other activities on the site would be considered potentially significant.

The exposure of sensitive receptors to TAC emissions can occur during both the construction and operational phases of the project. Health-related impacts associated with short-term construction and long-term stationary and mobile-source operational emissions are discussed separately, as follows.

Short-Term Construction

Construction of the project and associated infrastructure would result in short-term diesel exhaust emissions from on-site heavy duty equipment. Diesel PM were identified as a TAC by ARB in 1998. Construction of the project would result in the generation of diesel PM emissions from the use of off-road diesel equipment required for site grading and excavation, paving, and other construction activities. According to ARB, the potential cancer risk from the inhalation of diesel PM, as discussed below, outweighs the potential noncancer health impacts (ARB 2003).

The dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHHA), health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project (Salinas, pers. comm., 2004). Thus, because

the use of mobilized equipment would be temporary (i.e., less than 7% of the total exposure period for which risk is based upon) in combination with the dispersive properties of diesel PM (Zhu and Hinds 2002) and project construction activities would not be atypical in comparison to similar development-type projects (i.e., no excessive material transport or associated truck travel), short-term construction activities would not result expose sensitive receptors to substantial TAC concentrations. This would be a *less-than-significant* impact.

Stationary Sources

Long-term operation of the project would likely include the installation of diesel-fueled emergency backup generators at some of the proposed land uses. This category of stationary sources, in addition to any other stationary sources that may emit TACs, would be subject to SMAQMD permitting and T-BACT requirements.

The proposed project includes construction of commercial land uses, which may potentially include stationary sources of TACs, such as dry cleaning establishments, gasoline dispensing facilities, diesel-fueled back-up generators. These types of stationary sources, in addition to any other stationary sources that may emit TACs, would be subject to SMAQMD rules and regulations, including SMAQMD Rule 201 (General Permit Requirements), Rule 202 (New Source Review), Rule 904 (Air Toxics Control Measures), and Rule 207 (Title V-Federal Operating Permit Program), T-BACT requirements. Thus, as discussed above, SMAQMD would analyze such sources (e.g., health risk assessment) based on their potential to emit TACs. If it is determined that the sources would emit TACs in excess of SMAQMD's applicable threshold of significance, T-BACT would be implemented in order to reduce emissions. If the implementation of T-BACT would not reduce the risk below the applicable threshold, SMAQMD would deny the required permit. As a result, given compliance with applicable rules and regulations, operation of any stationary sources would not result in the exposure of sensitive receptors to TACs at levels exceeding SMAQMD's significance threshold. This would be a *less-than-significant* impact.

Airport

In recent years there has been heightened scientific awareness and public debate over potential impacts that may result from the exposure of sensitive receptors to TACs generated for aircraft and ground support operations at and near airports. Sources of airport-related TACs include aircraft (e.g., air carriers, commuter and cargo aircraft, and general aviation), ground service equipment, fuel storage and handling, and others. TACs released by these sources include, but are not limited to, volatile organic compounds, VOCs (acetaldehyde, formaldehyde, benzene, and 1,3-butadiene), chromium, dioxins, polycyclic organic compounds (PAHs), tetrachloroethylene, nickel, and toluene.

Several studies and analyses have been performed in an effort to evaluate the risk posed from airport operations. In 1999 and 2000, public initiated studies and analyses of toxic emissions from the O'Hare International Airport and associated health risks in surrounding residential communities were released. The overall findings of these analyses were that the cancer risks associated with operations at O'Hare Airport exceeds 10 in 1 million over an area of approximately 40 square miles and one in 1 million over an area of approximately 1,000 square miles, assuming 70 years of exposure (Environ 2000). These studies also identified the need for better assessment of the data used and recommended that comprehensive air monitoring be conducted around O'Hare so that these data could be used to conduct a more complete and comprehensive analysis.

In response, the Illinois EPA monitored toxic air contaminants in the vicinity of O'Hare as well as other locations in the Chicago area from June to December of 2000, focusing on toxic compounds

identified in EPA's national strategy and on mobile-source emissions associated with airport operations (Illinois EPA 2002). The compounds of interest included volatile and semivolatile organics, carbonyls, and trace metals. The purpose of this program was to collect information that would help assess the relative impact of airport-generated emissions and toxic characteristics of large urban areas. One important objective of the monitoring program was to determine if the emissions associated with O'Hare have a measurable impact on air quality in areas adjacent to the airport. A review and analysis of the accumulated monitoring results found that the levels of toxic compounds (e.g., acetaldehyde and formaldehyde) attributable to airport operations were detected at monitoring sites. However, the concentrations of such compounds were indistinguishable from (or lower than) typical urban background levels.

Overall, from the studies and analyses conducted so far, including those discussed above, uncertainties in data and methods have provided an inadequate foundation to perform airport-related health studies. More recently, in an effort to improve available data, a multiagency aircraft particle emissions experiment (APEX) was established with participants from EPA, the National Aeronautics and Space Administration (NASA), the Federal Aviation Administration (FAA), the aviation industry (GE and Boeing), and the research community (Massachusetts Institute of Technology [MIT]). The main focus is to test aircraft engines for TACs. Data from this study are currently being analyzed and updated emission factors to follow in approximately 2 years. This will, along with further monitoring around airports and validation of modeling results, allow the compilation of more accurate emissions data into EPA models and identification of the proper characterization methods.

Based on the above discussion, it can be ascertained that the proposed project, because of its proximity to the Sacramento International Airport, has the potential to expose sensitive receptors to toxic air emissions to an extent that health risks could result. However, this issue is not well understood and is the subject of ongoing research, and any conclusions regarding health risks would be speculative. Therefore, a conclusion on significance of the environmental impact cannot be reasonably reached. Section 15145 of the State CEQA Guidelines provides that, if after a thorough investigation a lead agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impacts. This is the case here. No impact conclusion can be made based on research of this issue.

Off-site Mobile Sources

As previously discussed, the project site is located adjacent to Interstate I-5 and SR 70/99 (refer to Exhibit 3-3 of this report). The proposed project includes a mix of land uses, including commercial and residential uses, senior housing, and an elementary school. The nearest proposed residences would be within approximately 300 feet of I-5 and SR 70/99. Proposed senior housing would be located approximately 1,200 feet from I-5 and approximately 1,500 feet from SR 70/99. The proposed elementary school would be located near the southeastern portion of the project site, approximately 545 feet from I-5 and SR 70/99.

In April 2005, ARB published a guidance document entitled *Air Quality and Land Use Handbook: A Community Health Perspective*, which includes the recommendation to avoid siting of new sensitive land uses (e.g., residences and schools) within 500 feet of freeways. In addition, the recently adopted Senate Bill 352 (SB 352) (Education Code Section 17213, Public Resources Code Section 21151.8) expands upon previous requirements for the review of TAC sources near school sites. Accordingly, SB 352 requires that any school site located within 500 feet of the edge of the closest travel lane of a freeway or other busy traffic corridor be reviewed for potential health risks. The location of the school site, which as discussed above would be further than 500 feet from the nearby freeways, would be consistent with the above recommendations. Consequently, off-site mobile-source TAC emissions at the school site would be considered less than significant;

however, the location of the nearest proposed residences would not be in concurrence with ARB recommendations. The ARB guidance document is not regulatory. ~~The SMAQMD has not established any guidelines for the assessment of such impacts or any applicable thresholds, as the 10 in one million threshold mentioned above only applies to individual stationary type sources, and not to the mobile source emissions at issue here. (Maertz, pers. comm. 2006).~~

In August 2006, SMAQMD adopted a protocol for determining potential risk from exposure to mobile-source TACs. The district recommends using *Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways* (July 31, 2006; since then, replaced by a draft dated October 2006), prepared for SMAQMD (letter from Borkenhagen, SMAQMD, in comments on the Greenbriar Project Draft EIR). The recommended protocol is a three-step process: (1) Determine if any residences are within 500 feet of a major roadway. (2) If they are, determine via a table included in the recommended protocol if the project is subject to a cancer risk from TACs of 370 in 1 million or greater. (3) If they are not, report the results. If they are subjected to this level of risk, conduct a site-specific health-risk assessment (HRA). A risk of 370 in 1 million is not intended to convey a health threshold; rather, according to the protocol, this level represents a doubling of cancer risks compared to ambient cancer risks in the county.

The proposed project includes residences within 300 feet of I-5 and SR 70/99, so the second step of the recommended protocol is invoked. Based on year-2025 cumulative traffic data (see Table 6.1-40) and the tables in the protocol, residences closest to I-5 would be subject to an incremental cancer risk of between 90 and 135 per 1 million and residences closest to SR 70/99 would be subject to an incremental cancer risk of between 24 and 45 per 1 million. According to the protocol, this risk is below the level requiring a site-specific HRA. These data are not site-specific.

~~Although not required by the recommended protocol, a site-specific A health-risk assessment (HRA) was prepared by Sierra Research to evaluate the potential health-related impacts on on-site sensitive receptors, proposed as part of the project, from exposure to off-site, on-road, mobile sources of TACs associated with nearby freeways (i.e., I-5 and SR 70/99) (refer to Appendix E). A summary of the HRA is included for informational purposes. The SMAQMD does not currently recommend the use of HRAs for assessing the potential risk from diesel PM adjacent to freeways until specific guidelines for development and review have been established by the District. This is based on the limitations of HRAs conducted to date regarding the level of uncertainty in real world assumptions, model selection, and due in large part to a number of complexities associated with methodologies and their applicability to mobile source conditions (Maertz, pers. comm., 2006).~~

~~That stated, the~~ The results of the HRA are included because they provide the best informational basis for considering relative risk of exposure at the site. However, they need to be considered with caution, respecting the concerns raised above. To assess the risk, vehicle emissions on the freeway segments were quantified by Sierra Research for 21 TACs, and the cancer risk and noncancer acute and chronic hazard indices were estimated at various distances from I-5, SR 70/99, and the interchange using dispersion modeling. Dispersion modeling was performed in 5-year increments, beginning with the initial year of construction (2007) (Sierra Research 2005).

Based on the findings of the HRA, the highest modeled acute and chronic noncancer hazard indices at all distances from the freeway segments and for all years analyzed were 0.63 and 0.26, respectively. The acute and chronic hazard indices represent the potential noncancer health impacts resulting from short-term (1-hour) and long-term (from 1 year to a 70-year lifetime) exposure to TACs, respectively. The hazard indices are calculated by dividing the concentrations of TACs by the applicable reference exposure levels (i.e., an indicator of potential noncancer health impacts and defined as the concentration at which no adverse effects are anticipated).

For the residences nearest the freeways, the highest modeled 70-year average cancer risk was 5.5% of the 2000 total average risk for the entire SVAB as determined by ARB (i.e., the total risk from exposure to all air pollutants was calculated by ARB to be 520 chances in 1 million), which interpolates to 28.6 29 chances in 1 million (Sierra Research 2005). This cancer risk represents the number of chances in 1 million of developing cancer based on 70-year exposure duration. It is unlikely that many individuals would actually reside on the site for 70 years; according to the U.S. Census (2000), in California approximately 9% of owner-occupied housing and 28% of rental housing turns over each year. If this type of turnover rate is applied to Greenbriar, the average residence time in an owner-occupied house would be 11 years, and in a rental house would be 3½ years. The cancer risk over a 70-year period is a common metric, but the average risk would be reduced to a fraction based on statistical average residence times. Thus, an average concern risk for residents would more closely average five in 1 million for single-family residents (based on 11 years of residence) and two in 1 million for rental housing (based on 3½ years of residence).

With respect to the SVAB, the 2000 total average risk of 520 chances in 1 million, as determined by ARB, takes into account emissions of 10 select TACs that pose the greatest risk in California based primarily on ambient air quality data from all sources (e.g., stationary, area, on-road mobile, other mobile, and natural). According to ARB's emissions inventory for 2000, approximately 23% of the total SVAB acetaldehyde emissions for that year, 43% of benzene, 39% of 1,3-butadiene, 31% of formaldehyde, and 28% of diesel PM were associated with on-road mobile sources (California Air Resources Board 2001). Based on these percentages and the individual health risks as determined by ARB in 2000 for each TAC, approximately 27.5% (143 chances in 1 million) of the total baseline SVAB estimated risk of 520 chances in 1 million was associated with on-road mobile sources, 70% of the that risk being attributable to diesel PM alone. According to ARB, implementation of the risk reduction plan to reduce diesel PM is estimated to drop 2010 and 2020 concentrations, and associated health risk by 75% and 85% respectively, from the estimated 2000 level (California Air Resources Board 2005a). ARB also estimated a range of relative cancer risk near freeways of 300–1,700 chances in 1 million, as contained in the *Air Quality and Land Use Handbook* (California Air Resources Board 2005b).

By comparison, the highest 70-year risk value estimated at the proposed residences nearest the freeways is five times lower than 1/5 the risk of 143 chances in 1 million from on-road mobile sources, as interpolated from ARB's 2000 total average risk for SVAB, and more than 10 times lower than less than 1/10 of the low end of ARB's range of 300–1,300 chances in 1 million, as presented in the *Air Quality and Land Use Handbook* (Sierra Research 2005).

However, though the comparison above relates the risk estimated by Sierra Research from on-road mobile sources to those attributable to the same source-type as estimated by ARB, the modeling methodologies (e.g., model, timeframe, TACs analyzed) used by each differ and could account for differences between the results. Also, because SMAQMD has not established specific guidelines for the development and review of HRAs for such impacts, SMAQMD cannot support any conclusions drawn from the results thereof (Maertz, pers. comm., 2006). In the interim, SMAQMD recommends, as does the ARB, the potential risk be considered in the planning process (Maertz, pers. comm., 2006). It is also important to note that the recommendations of the ARB concerning the siting of sensitive receptors provides guidance on planning issues and are not adopted thresholds for which development projects can be evaluated against. The HRA provides the best approach available for comparing project risk to baseline risk of exposure to TACs, in order to determine the project's incremental risk of exposure. The project's cancer risk from exposure to on-road mobile-source TACs, as described above, for the residents closest to freeways, is 29 in 1 million. The project risk reflects expected improvements in TAC emissions control over time. Similarly, if the current background cancer risk (the average risk in the entire air basin) from on-road mobile-source TACs is 143 in 1 million. The background risk is reduced by 75%–85%, as

predicted (see discussion above), the background cancer risk would range from 21 (85% reduction) to 36 (75% reduction) in 1 million. Thus, the site-specific HRA shows that residences nearest the freeways would be exposed to an on-road mobile-source risk that is less than current background risk (29 in 1 million for the project compared with 143 in 1 million for current background), and a long-term risk that is roughly the same as the background (the 75%–85% reduction results in an on-road mobile-source TAC cancer risk range of 21–35 in 1 million compared to the project risk at 29 in 1 million). In all cases, the incremental risk (the project compared to the background) from the project does not exceed 10 in 1 million. Further, when average residence times are taken into consideration, the risk of exposure is even less, at between two (for rental housing) and five (for owner-occupied housing) in 1 million.

Based on the above discussion, it can be ascertained that the proposed project, because of its proximity to existing freeways, has the potential to expose sensitive receptors to TACs to an extent that health risks could result. Since this potential risk is related to existing sources of emissions (i.e., the adjacent roadways), and not to emissions from the project, it is important to understand the trend in emissions (and associated risk) from these existing sources. As shown in Table 6.2-6 below, and as summarized above, the TAC risk management programs implemented by SMAQMD and ARB have been extremely effective at reducing risks from toxic air contaminants in the Sacramento area.

**Table 6.2-6
Summary of Health Risks from Toxic Air Contaminants Sacramento Valley Air Basin**

	1990	1995	2000	2004	Change (1990–2004)
All TACs	1,135	705	520	<478 ²	-58%
Mobile-Source TACs ¹	1,079	624	447	<430 ²	-60%
Mobile-Source TACs (excluding Diesel PM)	329	144	87	73	-78%
Diesel PM	750	480	360	<360	>52%

Notes: ARB estimates changes in Diesel PM health risk every 5 years; 2004 data are based on the assumption that these levels are lower than those estimated for 2000.
¹ Benzene, 1,3-butadiene, and Diesel PM.
Source: Sierra Research 2006; California Air Resources Board 2006, *The California Almanac of Emissions and Air Quality*, 2006 Edition

Although the values presented in Table 6.2-6 represent estimated exposures throughout the SVAB, the trend in risks from mobile-source TACs applies equally to the proposed project location, where the background health risk is expected to be dominated by the health risks associated with emissions from motor vehicles on nearby roadways. Consequently, although residents in the proposed project development may be exposed to health risks that are somewhat elevated as compared with other locations, these health risks are declining substantially, and are expected to continue to decline, as a result of existing ARB and SMAQMD regulatory programs.

Further, in considering relative risk and the thresholds used in the EIR to determine whether the cancer and other health risks would be significant, the analysis shows that under all considerations (current and improved future background TAC exposure), the project does not expose residences to an incremental (i.e., additional over background) cancer risk of 10 in 1 million and does not result in exposure to an acute and chronic hazard index of 1.0 or greater. Consequently, this impact is concluded to be ***less than significant***. Importantly, this analysis provides information on the relative level of health risk, including disclosures on increased health risks along the margins of the freeways, to allow the City of Sacramento to make the most informed decision currently possible on this issue.

On-site Mobile Sources

On-site mobile sources of TACs would be associated primarily with the operation of school buses transporting students to and from the proposed elementary school, as well as diesel-powered delivery trucks associated with proposed on-site commercial activities.

Emissions from school buses can vary, depending on various factors, including bus type, age, maintenance, and amount of time spent idling. Health impacts from exhaust exposure include eye and respiratory irritation, enhanced respiratory allergic reactions, asthma exacerbation, increased cancer risk, and immune system degradation. Generally, children are more vulnerable to air pollutants because of higher inhalation rates, narrower airways, and less mature immune systems.

In response to the above issue, ARB adopted an air toxic control measure (ATCM) as part of the Particulate Matter Risk Reduction Plan to specifically deal with diesel emissions from school buses. This ATCM became effective July 16, 2003. The school bus-idling ATCM includes the following requirements:

- (a) The driver of a school bus or vehicle, transit bus, or heavy-duty vehicle (other than a bus) shall manually turn off the bus or vehicle upon arriving at a school and restart no more than 30 seconds before departing. A driver of a school bus or vehicle shall be subject to the same requirement when operating within 100 feet of a school and shall be prohibited from idling more than 5 minutes at each stop beyond schools, such as parking or maintenance facilities, school bus stops, or school activity destinations. A driver of a transit bus or heavy-duty vehicle (other than a bus) shall be prohibited from idling more than 5 minutes at each stop within 100 feet of a school. Idling necessary for health, safety, or operational concerns shall be exempt from these restrictions.
- (b) The motor carrier of the affected bus or vehicle shall ensure that drivers are informed of the idling requirements, track complaints, and enforcement actions, and keep track of driver education and tracking activities.

According to ARB, implementation of the above requirements would eliminate unnecessary idling for school buses and other heavy-duty vehicles, protecting children from unhealthful exhaust emissions and thus reducing localized exposure to air toxic contaminant and other harmful air pollution emissions at and near schools.

In addition to the school bus-idling ATCM, ARB recently adopted an idling-restriction ATCM for large commercial diesel-powered vehicles, which became effective February 1, 2005. In accordance with this measure, affected vehicles are required to limit idling to no longer than 5 minutes under most circumstances. ARB is currently evaluating additional ATCMs intended to further reduce TACs associated with commercial operations, including a similar requirement to limit idling of smaller diesel-powered commercial vehicles. Nonetheless, given that proposed on-site commercial land uses have not yet been identified and given the potential proximity of nearby sensitive receptors, exposure of nearby on-site receptors to mobile-source TACs associated with commercial activities would be considered *potentially significant*.

Mitigation Measure 6.2-4: (City of Sacramento and LAFCo)

On-site Mobile Sources. The following mitigation measures shall be implemented:

- a. Proposed facilities that would require the long-term use of diesel equipment and heavy-duty trucks shall develop and implement a plan to reduce emissions, which may include such measures as scheduling such activities when the residential uses are the least occupied, and requiring such equipment to be shut off when

not in use and prohibiting heavy-trucks from idling. The plan shall be submitted to and approved by the City before loading-dock activities begin. Copies of the plan shall be provided to all residential dwellings located within 1,000 feet of loading dock areas.

- b. Proposed commercial/convenience land uses (e.g., loading docks) that have the potential to emit toxic air emissions shall be located as far away as feasibly possible from existing and proposed sensitive receptors.

Significance After Mitigation

Implementation of the above mitigation measure would reduce health-related risks associated with on-site mobile-source TACs, but not necessarily to a less-than-significant level. Exposure to mobile-source TAC emissions from on-site mobile sources are, therefore, considered **significant and unavoidable**. This conclusion is because of the uncertainty associated with on-site commercial land use activities and the proximity of sensitive receptors to such uses. This conclusion may, therefore, change as more detailed information regarding proposed on-site commercial uses becomes available.

Regarding exposure to TACs from freeways adjacent to the site, the current regulatory programs being implemented by ARB have resulted in and are expected to continue to result in a substantial reduction in exposure to TACs. This reduction has resulted in a commensurate reduction in health risks from exposure to TACs at the project site and along all major roadways in the Sacramento region.

IMPACT 6.2-5

Exposure to Odor Emissions. *Operation of the proposed project could result in the frequent exposure of on-site receptors to substantial objectionable odor emissions. As a result, this impact would be considered significant.*

No major sources of odors have been identified in the project area that would result in the exposure of on-site receptors to existing odorous emissions.

Minor sources of odors associated with the proposed project would be associated primarily with the construction of the proposed land uses. The predominant source of power for construction equipment is diesel engines. Exhaust odors from diesel engines, as well as emissions associated with asphalt paving and the application of architectural coatings, may be considered offensive to some individuals. However, because odors would be temporary and would disperse rapidly with distance from the source, construction-generated odors would not result in the frequent exposure of on-site receptors to objectionable odorous emissions. As a result, short-term construction-related odors would be considered **less than significant**.

Commercial uses may include sources of odorous emissions (e.g., charbroiling restaurants, dry cleaners). The operation of such sources could result in the frequent exposure of on-site receptors to substantial objectionable odorous emissions. As a result, this impact would be considered **potentially significant**.

Mitigation Measure 6.2-5: (City of Sacramento and LAFCo)

The following mitigation measures shall be implemented:

- a. To the extent feasible, proposed commercial/convenience land uses that have the potential to emit objectionable odor emissions shall be located as far away as possible from existing and proposed receptors.
- b. When permitting the facility that would occupy the proposed commercial/convenience space, the City shall take into consideration its odor-producing potential.

- c. If an odor-emitting facility is to occupy space in the commercial/convenience area, the City shall require odor control devices (e.g., wet chemical scrubbers, activated carbon scrubbers, biologically-active filters, enclosures) to be installed to reduce the exposure of receptors to objectionable odor emissions.

Implementation of the above-mentioned mitigation measures would prevent high numbers of odor complaints by ensuring that odor sources are located near sensitive receptors and reduce the affects of any odor-generating facilities by addressing odors at the source. Thus, implementation of Mitigation Measure 6.2-5 would reduce this impact to a *less-than-significant* level.

6.10 HYDROLOGY, DRAINAGE, AND WATER QUALITY

6.10.1 INTRODUCTION

This section addresses potential hydrology and water quality impacts that would result with implementation of the proposed project. Issues related to the availability of water supply and potential environmental impacts related to the use of existing and planned supplies are addressed in Section 6.5, “Utilities.”

6.10.2 ENVIRONMENTAL SETTING

HYDROLOGY AND DRAINAGE

Regional Setting

Sacramento Area

The City of Sacramento is located at the confluence of the Sacramento River and American River in the Sacramento River Basin. The Sacramento River Basin encompasses approximately 26,500 square miles and is bounded by the Sierra Nevada to the east, the Coast Ranges to the west, the Cascade Range and Trinity Mountains to the north, and the Sacramento–San Joaquin Delta (Delta)/Central Sierra Nevada area to the south. Six small tributaries of the Sacramento River (Dry Creek, Magpie Creek, and Arcade Creek in the northern area of the city, and Morrison Creek, Elder Creek, and Laguna Creek to the south) pass through and provide drainage for the Sacramento area. Forty miles to the south, the Sacramento River joins the San Joaquin River, which drains into the Delta and San Francisco Bay.

Average annual rainfall in the Sacramento area is 17.22 inches; most of this rain occurs during the months of November through March. Major storm events can produce high flows throughout the Sacramento and American River systems. Flood control facilities along these rivers consist of a comprehensive system of dams, levees, overflow weirs (diversion structures intended to ensure a maximum flow in the river), drainage pumping plants, and flood control bypass channels. Such facilities control flood flows by regulating the amount of water passing through a particular reach of the river. Specifically, the City of Sacramento’s (City’s) stormwater drainage system consists of a network of natural channels, canals, levees, subsurface drains, and pumping stations that ultimately drain into the Sacramento and American Rivers. Urban runoff is disposed of via one of two methods: (1) conveyance to the Sacramento and American Rivers through sumps, pipelines, and treatment facilities organized, primarily, by drainage basin; or (2) conveyance by the City’s Combined Sewer Service System, along with sewage, to the Sacramento Regional Wastewater Treatment Plant (SRWTP).

The volume of water flowing past the levee system that protects Sacramento from flooding is controlled by Folsom Dam on the American River, approximately 25 miles east of the project area, and the reserve overflow area of the Yolo Bypass on the Sacramento River. The majority of the City’s corporate limits and the project area could be subject to flooding from failure along the Sacramento and American River levee systems. Folsom Dam was completed in 1956 and was designed to reduce flood flows in the American River to a flow rate that could be safely carried by the downstream levees. A dam is designed to contain a flood that has a certain probability of occurring in any given year. If a larger flood occurs, then that structure will either release water through its spillway or be overtopped. There have been no dam failures in Sacramento County since 1950 (County of Sacramento 2004, cited in City of Sacramento 2005).

Folsom Dam was designed to provide flood control for Sacramento up to a 500-year level storm (i.e., a storm with 0.2% chance of occurring in a given year). However, after the dam became operational, a series of record storms and flood flows resulted in downgrading the dam’s projected design flood. In 1986 Folsom’s performance was downgraded to about a 60-year storm (SAFCA 2005a). An initial reconnaissance report, American River Investigation, January 1988, concluded that Folsom Dam and the American River levees were only capable of

handling a 70-year flood event (County of Sacramento 1993). Nonetheless, Folsom Dam has stopped three potentially catastrophic floods from occurring. In February 1986, the levee system passed a volume of water generated by the 80- to 100-year flood event. The 1986 storm exceeded Folsom's design for flooding by almost 20% (County of Sacramento 1993). Although the storm caused some flooding in certain areas, the major levee systems that protect the city from disaster withstood record water flows.

In the wake of the 1986 storm, efforts were undertaken to reduce the Sacramento area's vulnerability to catastrophic flooding. In 1989 the Sacramento Area Flood Control Agency (SAFCA), a joint powers agency established by the City of Sacramento, the County of Sacramento, the County of Sutter, the American River Flood Control District, and Reclamation District 1000 (RD 1000), was formed with the goal of providing at least 100-year flood protection for the area, and ultimately 200-year flood protection (SAFCA 2005b). In 1994, SAFCA and the U.S. Bureau of Reclamation agreed to adjust and coordinate operations at Folsom Dam so that upstream reservoirs could assist in flood control measures. Congress approved the funding of American River levee improvements in 1996. In 1999, Congress again approved significant flood control projects, including the enlargement of the outlets in Folsom Dam (City of Sacramento 2005). More recently, Congress authorized funding for additional improvements, including raising the height of Folsom Dam by 7 feet, in the Energy and Water Development Appropriations Act of 2004 (Public Law 108-357) to provide 200-year flood protection for Sacramento (SAFCA 2005c). Construction of this "mini-raise" has not yet begun, and at this time it is not known when construction would begin.

The Yolo Bypass is part of the Sacramento River Flood Control Project, which includes six weirs, three flood control relief structures, and an emergency overflow roadway. Weirs located along the Sacramento River are lowered sections of levees that allow flood waters to flow in excess of the downstream channel capacity to escape into a bypass basin or channel (e.g., Yolo Bypass). The Yolo Bypass is a flood bypass area that primarily protects the City of Sacramento and surrounding communities from flooding along the Sacramento River. The Yolo Bypass conveys 80 percent of the Sacramento River's floodwaters through Yolo and Solano Counties until rejoining the Sacramento River a few miles upstream of Rio Vista. The Fremont Weir, located approximately 9 miles northwest of the project site and approximately 2 miles in length, marks the northern extent of the Yolo Bypass. The Fremont Weir is the main water input to the Yolo Bypass by allowing floodwaters to flow by gravity after water levels in the Sacramento River reach an overflow water surface elevation. The Sacramento Weir, located approximately 5 miles south of the project site, has a primary purpose to protect the City of Sacramento from excessive flood stages in the Sacramento River channel downstream of the American River. The Sacramento Weir is 1,920 feet long and consists of 48 gates that divert Sacramento and American River floodwaters to the Yolo Bypass. The Sacramento Weir uses gates located on top of the overflow section to hold back floodwaters until opened manually (DWR 2003a).

Natomas Basin

The Natomas Basin is a low-lying area east of the Sacramento River, north (upstream) of its confluence with the American River. The basin is served by a series of canals and pump stations. In the undeveloped areas of Natomas, canals and drains serve the dual purpose of providing flood control and irrigation water. Irrigation water is provided in the area by Natomas Central Mutual Water Company (Natomas Mutual), a private water company whose service area includes the entire Natomas Basin. Natomas Mutual diverts water from the Sacramento River and the Natomas Cross Canal to provide irrigation water for agricultural uses and habitat preservation. Drainage and flood control for the Natomas Basin is provided by RD 1000, a public agency that has a coinciding service area and several joint-use facilities with Natomas Mutual. RD 1000 operates the primary drainage canals within the Natomas Basin and is responsible for conveying and pumping urban and nonurban stormwater runoff from the basin. Runoff from developed and existing agricultural lands within the Natomas Basin flows into numerous local drainage ditches that ultimately drain into the primary RD 1000 canals. RD 1000's primary system of interior drains includes the following:

- ▶ The *East Drainage Canal* conveys drainage water from the northern and eastern Natomas Basin to its confluence with the Main Drainage Canal northwest of the Interstate 80 (I-80)/Interstate 5 (I-5) interchange. At its closest point the East Drainage Canal is approximately 1.8 miles east of the project site.
- ▶ The *West Drainage Canal* conveys drainage water from the western Natomas Basin northwest of Sacramento International Airport to its confluence with the Main Drainage Canal. Fisherman’s Lake, a natural slough, is a portion of the West Drainage Canal. The West Drainage Canal is approximately 3,000 feet (0.6 mile) south of the project site at its closest point across I-5, just before the drainage canal turns south toward Fisherman’s Lake.
- ▶ The *Main Drainage Canal* conveys the combined flows of the East and West Drainage Canals from their confluence northwest of the I-80/I-5 interchange through South Natomas west of I-80. Drainage water from the Main Drainage Canal is pumped into the Sacramento River approximately 5 miles to the south (downstream) of the project site.
- ▶ The *North Drainage Canal* is an interior canal that conveys drainage water from the Sutter County portion of the Natomas Basin northward, where it is pumped into the Natomas Cross Canal.
- ▶ The *Natomas Cross Canal (NCC)* conveys drainage water from central portions of Sutter County westward to the Sacramento River. The NCC connects with the Sacramento River approximately 7.1 miles north of the project site.
- ▶ The *Natomas East Main Drainage Canal* conveys drainage water from Dry Creek, Arcade Creek, and a large portion of the Natomas area north of the confluence with Dry Creek. The Natomas East Main Drainage Canal is also referred to as Steelhead Creek. The Natomas East Main Drainage Canal outfalls to the Sacramento River at the northern edge of Discovery Park and near the confluence of the Sacramento River and American River approximately 5.2 miles south of the project site.

Exhibit 6.10-1 graphically depicts this primary drainage system.

The City is responsible for maintenance of internal conveyance, detention basins, and pump stations that discharge into the system; RD 1000 is responsible for maintenance of the canal system. The North Natomas Comprehensive Drainage Plan (CDP) (see the discussion of local regulations in Section 6.10.3, “Regulatory Setting”) identifies various basin areas including detention basins and pumping facilities to convey discharge to the existing RD 1000 system within the North Natomas Community Plan area. Developed flow discharges to the RD 1000 system are limited to approximately 0.1 cubic foot per second (cfs) per acre, which is generally the standard for development in North Natomas.

Historically, the flood control system within the Natomas Basin was adequate for agricultural use, but the urbanization of the basin has resulted in the need for an increased level of flood protection. The North Natomas CDP is among the flood control efforts which created or modified storm water detention basins, detention basin pump stations, and trunk lines. As part of the North Natomas CDP, the North Area Local Project, a flood control project begun in 1993 under the direction of the Sacramento Area Flood Control Agency (SAFCA), was completed in 1998. As a result, North and South Natomas (including the project site) were deemed to have a “100-year” level of flood protection by the Federal Emergency Management Agency (FEMA). (The “100-year” flood is defined as having a one in 100 chance [1%] of occurring in any given year). The levees were found to meet FEMA criteria for 100-year flood protection under a previous system of levee evaluation.

SAFCA has undertaken numerous improvement projects over the last decade that focused on providing facilities that could contain a 200-year flood in the Lower Sacramento and American Rivers and the diversion channels around the perimeter of the Natomas basin. In 1998, the U.S. Army Corps of Engineers (USACE) concluded that levee raising and strengthening projects completed in 1986 (as part of the Sacramento Urban Levee Reconstruction Project and North Area Local Project) provided the Natomas Basin adequate protection to safely contain a 100-year flood. However, high-water events that occurred during 1997 in the Sacramento Valley and the

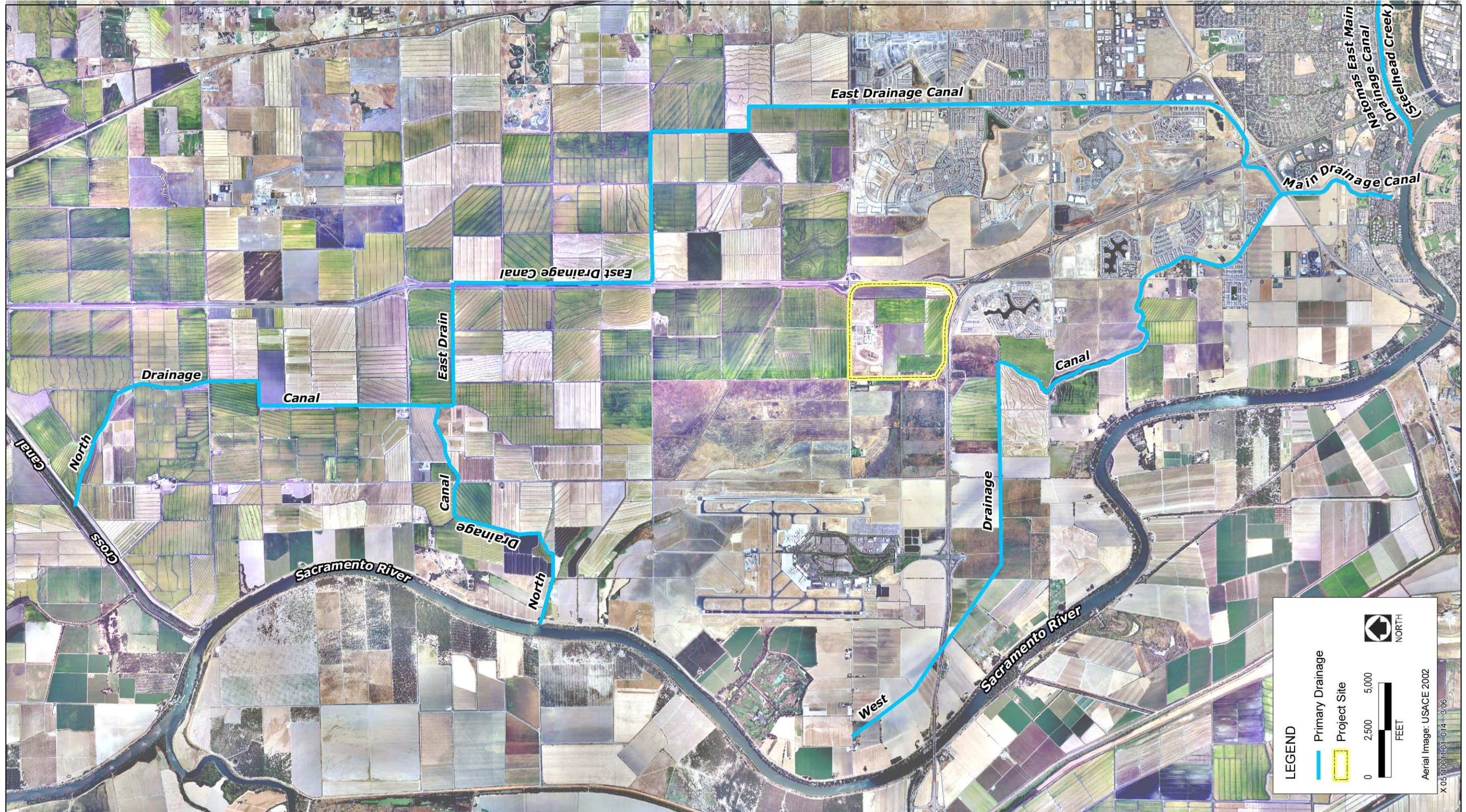
resulting failure of some levees began to alter the geotechnical engineering community's understanding and approach to deep underseepage issues. Following the floods of 1997, USACE and SAFCA assessed subsurface conditions to determine the need for deep underseepage remediation for the Natomas area levees. These studies determined that, at some locations, there exists a potential for subsurface permeability that could threaten the stability of the affected levees if not addressed.

Because deep underseepage was a newly recognized concern in the Sacramento Valley, and because of the magnitude and anticipated cost for needed levee improvements, USACE and its nonfederal partners (i.e., the state and SAFCA) determined that a panel of experts should be convened to review and refine the USACE guidelines for evaluating the risk of underseepage and for designing remedial measures. As a result, the USACE Levee Seepage Task Force convened in early 2003 and completed its work in July 2003. Based on the task force findings, USACE developed a new Standard Operating Procedure Engineering Design Guidance 2003 (SOP EDG-03) for Geotechnical Levee Practice, which recommended guidelines for evaluating, designing, and maintaining levees. These guidelines were adopted by USACE's Sacramento District in August 2004. With the new SOP EDG-03 as a guide, USACE and SAFCA collaborated to develop a plan for moving forward with Natomas levee improvements needed to achieve 200-year flood protection and to address priority levee deficiencies that may be identified.

In 2005 and early 2006, SAFCA conducted additional assessments of seepage potential along the east levee of the Sacramento River, the south levee of the NCC, and the north levee of the American River in its Natomas Levee Evaluation Study (NLES) (July 14, 2006) and concluded that approximately 26 miles of the levees protecting the Natomas area are in need of improvements to correct seepage potential. The NLES also included evaluation of the potential for levee-threatening erosion along the east bank of the Sacramento River, the south bank of the NCC, and the west bank of the Pleasant Grove Creek Canal (PGCC) and Natomas East Main Drainage Canal (NEMDC/Steelhead Creek). Ten sites were identified along the Sacramento River east levee as having moderate to high potential for erosion that could lead to levee failure if not improved. Several sites along the NCC south levee and the PGCC and NEMDC/Steelhead Creek west levee were identified as needing further erosion analyses. In addition, levee height improvements in some locations on the Sacramento River east levee and the NCC south levee are needed to provide adequate freeboard to provide protection from a 200-year flood.

One of the main purposes for the NLES was to evaluate how application of the new underseepage guidelines adopted by USACE's Sacramento District would affect flood protection for the Natomas basin. The NLES assumed that the principal method of addressing identified problems in Natomas area levees would be to raise and strengthen the affected levees, control seepage, and stabilize eroding banks using techniques similar to those that have been implemented along the Lower American River. In addition, the NLES includes a conceptual assessment of constructing a new secondary levee in the upper reach of the Natomas area set back approximately 1,000 feet from the existing Sacramento River east levee.

SAFCA recently completed the NLES Final Report (July 14, 2006). This report concluded that considerable improvements would be needed along the south levee of the NCC, the east levee of the Sacramento River, and the north levee of the American River in order to provide the Natomas area with at least a 200-year level of flood protection and to redesignate the area to a "low" risk status. While the purpose of the study was to address needed improvements to provide 200-year flood protection, the NLES also included an evaluation of the levees' ability to withstand 100-year flood events. USACE and SAFCA determined that at some locations, the calculated seepage exit gradients exceeded adopted guidelines and the borings collected along the levees indicated a potential for subsurface permeability that, if not addressed, could affect the stability of the affected levees. In review of the NLES, USACE issued a letter to SAFCA stating it "can no longer support its original position regarding the certification of the levees in the Natomas area." While official proceedings to decertify the Natomas area levees have not been completed as of the publication of this document, there is evidence to suggest that the Natomas area levees currently do not meet USACE 100-year flood protection criteria.



Sources: City of Sacramento 2002, EDAW 2005

Primary Drainage System in the Natomas Basin

Exhibit 6.10-1

SAFCA is currently preparing an environmental document that evaluates the impacts of the Natomas Levee Improvement Project (NLIP). The primary goal of the improvements is to correct freeboard deficiencies, levee seepage potential, and streambank erosion conditions to provide a 200-year level of protection. SAFCA anticipates approval of the project in spring 2007; however, the date of final completion of all levee improvements is unknown. The NLIP includes the establishment of an assessment district to collect fees that would fund the necessary improvements that would provide 200-year flood protection. SAFCA is also considering the adoption of a development impact fee that would be collected from new development within the Natomas area (in addition to the assessment district fee) to fund additional improvements to the levee system that are needed in the future to respond to changing geotechnical and hydrological conditions to ensure that adequate flood protection is provided in the Natomas area.

However, the levees have recently been found to require additional improvements under the current evaluation criteria which includes an underseepage analysis. As part of its Natomas Levee Evaluation Program, in July 2006 SAFCA completed a final report of erosion, underseepage, and levee failure issues along the Natomas levee system during a 200-year storm event. In addition, the study also evaluated the potential for levee failure from seepage during a 100-year storm event. The study concluded that several flood control facilities in the Natomas area do not provide sufficient freeboard (i.e., distance between the water surface and the top of the levee) during a 200-year storm event and some facilities are susceptible to underseepage and erosion during 100-year flood events (SAFCA 2006). SAFCA staff presented the results of the Natomas Levee Evaluation Program to the SAFCA Board of Directors (Board). The Board directed that staff commence with preparation of the necessary studies, analysis, and environmental documents to implement levee improvements to ensure that 200-year storm protection is provided within the Natomas area. In April 2006, the SAFCA Board approved the consultant contracts that would evaluate and ultimately implement the necessary levee improvements. The consultants will evaluate the needed levee improvements, make recommendations based on cost and design, for each associated with the recommended alternative, establish a funding program to implement the improvements, and will ultimately construct the improvements. SAFCA anticipates that improvements would be constructed within the next 2 to 5 years.

Project Site

Surface Water Hydrology

The project site is located in the southwestern portion of the Natomas Basin, within the Sacramento River Hydrologic Basin as defined by the California Department of Water Resources (DWR). The site occupies 577 acres of low-lying land approximately 2 miles northeast of the Sacramento River and 5 miles northwest (upstream) of the American River at their closest points. The project site is currently vacant undeveloped land supporting agricultural uses. The existing topography of the project site slopes from east to west in a southwesterly direction with elevations ranging from 5 to 25 feet. Because the site is generally flat, soils on the site may be susceptible to ponding. Soils on the project site are described further in Section 6.10, "Geology and Soils."

As discussed above, the North Natomas area was granted 100-year flood protection in 1998 as a result of local flood protection projects. Consequently, the project area was redesignated in Flood Zone X on the FEMA Flood Insurance Rate Map (FIRM) for the City of Sacramento dated July 6, 1998 (060262-0045E) (FEMA 1998). Based on this redesignation, the project area is considered to be protected from flooding from a 100-year storm event, including flooding from backwater effects. (The "backwater effect" refers to the rise in surface elevation of flowing water upstream of and resulting from an obstruction to flow, such as a narrow bridge opening, buildings, or fill material, that limits the area through which the water must flow.) As a result, there are currently no restrictions on development caused by flooding concerns. However, as described above in review of SAFCA's NLES, USACE issued a letter to SAFCA stating it "can no longer support its original position regarding the certification of the levees in the Natomas area." While official proceedings to decertify the Natomas area levees have not been completed as of the publication of this document, there is evidence to suggest that the Natomas area levees currently do not meet USACE 100-year flood protection criteria.

Drainage on the project site consists of several drainage/irrigation ditches that ultimately convey flows south. As shown in Exhibit 6.10-2, the project site consists of three major watersheds:

- ▶ The north/northwestern part of the site drains into the Lone Tree Canal, which parallels the western boundary of the site. The canal drains from north to south and joins runoff from the south/southeastern part of the site before flowing under I-5 through three existing 5-foot by 8-foot box culverts into an RD 1000 canal outside the project area. This canal, in turn, flows toward the RD 1000 West Drainage Canal. The 100-year peak flow through the three culverts, considered together, is 904 cfs (Wood Rodgers 2005).
- ▶ The eastern shed drains into the existing Natomas Mutual channel in the eastern portion of the site, then under SR 70/99, then southward toward the West Drainage Canal. The West Drainage Canal drains south and, as mentioned above, terminates in the Main Drainage Canal, which is pumped into the Sacramento River.

Runoff from the 540-acre-foot off-site watershed north of the project site discharges into the Lone Tree Canal during storms. The Lone Tree Canal measures approximately 12 feet wide at bottom and is 6 feet deep. The capacity of the Lone Tree Canal for a 100-year peak flow is 355 cfs (Wood Rodgers 2005). Sheet flow from the off-site watershed will cross Elkhorn Boulevard and enter the project site. This flow reenters the Lone Tree Canal on-site.

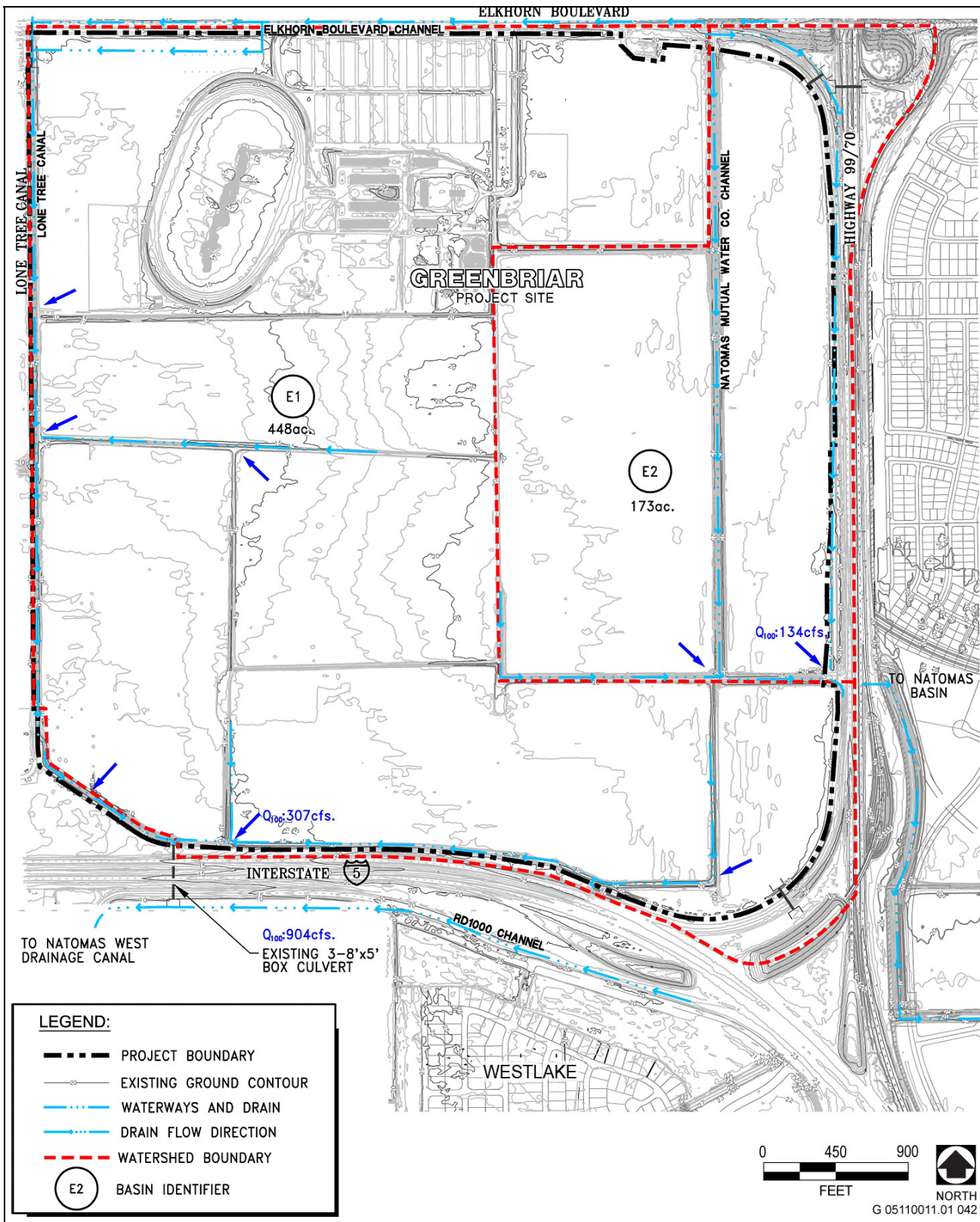
Groundwater Hydrology

Groundwater is defined by the Central Valley Regional Water Quality Control Board (RWQCB) *Water Quality Control Plan for the Sacramento and San Joaquin River Basins* (Basin Plan) as subsurface water that occurs beneath the ground surface in fully saturated zones within soils and other geologic formations. The Natomas area is located within the North American Groundwater Subbasin of the Sacramento Valley Groundwater Basin, as delineated in DWR Bulletin 118, *California's Groundwater* (2003 update) (DWR 2003b, cited in City of Sacramento 2005). The eastern boundary of the North American subbasin is a north-south line extending from the Bear River south to Folsom Lake and represents the approximate edge of the alluvial basin where little or no groundwater flows into or out of the groundwater basin from the Sierra Nevada. The western portion of the North American subbasin consists of nearly flat flood basin deposits from the Bear, Feather, Sacramento, and American Rivers, and several small eastside tributaries (DWR 2003b).

Groundwater occurs in unconfined to semiconfined states throughout the subbasin. Semiconfined conditions occur in localized areas; the degree of confinement typically increases with depth below the ground surface. Groundwater in the upper aquifer formations is typically unconfined. However, because of the mixed nature of the alluvial deposits, semiconfined conditions can be encountered at shallow depths in the upper aquifer (City of Sacramento 2005).

Groundwater levels in the city of Sacramento are reported to be stable at 20–40 feet above mean sea level (msl) (Sacramento Groundwater Authority 2003, cited in City of Sacramento 2005). In the Natomas Basin, groundwater levels vary seasonally with precipitation and runoff in this area and may rise closer to the ground surface during wet years. In addition, groundwater levels are influenced locally by pumping as the groundwater is withdrawn regularly during spring and summer for irrigation, and throughout the year for general use by most of the local growers; as a result, groundwater is generally higher in March and lower in October. Regional groundwater flow direction can be affected, at least temporarily, by agricultural groundwater pumping, time of year, and stage fluctuation of local creeks, drainage canals, and the nearby Sacramento River. The direction of groundwater flow is predicted to be easterly to southeasterly. (Wood Rodgers 2005.)

The current Sacramento County groundwater map (published March 2002) indicates that the groundwater in the vicinity of the project site is located at an elevation of approximately 0 feet to +5 feet relative to msl, or roughly 10–15 feet below the surface (County of Sacramento 2002). This level, measured in spring 2000, is lower than the 5–7 feet below the surface later observed by Wallace Kuhl and Associates in August 2002 and cited in its preliminary geotechnical report for the proposed project (Wallace Kuhl & Associates 2002). In its Phase I



Sources: Wood Rodgers 2005, EDAW 2005

Major Watersheds on the Project Site

Exhibit 6.10-2

Environmental Site Assessment (ESA) for the site, conducted in January 2004, Wallace Kuhl & Associates (2004) noted that groundwater is estimated to have historically varied from approximately 6.3 to 19.6 feet below the ground surface. Wallace Kuhl & Associates (2002) noted that excavations at the site deeper than 5 feet could encounter groundwater seepage.

WATER QUALITY

Surface Water

“Receiving waters” is a general term typically used to describe any surface water body, such as a creek, river, lake, bay, or ocean that receives runoff. As mentioned previously, the Natomas Main Drainage Canal conveys drainage water from the East and West Drainage Canals to the Sacramento River. Therefore, the Sacramento River is receiving water for much of the drainage from the Natomas Basin (including agricultural drainage). Agricultural drainage water contributes salts, nutrients, pesticides, trace elements, sediments, and other byproducts that could affect the water quality of the Sacramento River.

Water quality in the Sacramento River is regulated primarily by the Central Valley RWQCB. The Central Valley RWQCB has established narrative and numeric standards for the Sacramento River in its Basin Plan (Central Valley RWQCB 2004). The Basin Plan designates beneficial uses for Sacramento River water that include agricultural supply, contact water recreation, noncontact water recreation, warm freshwater habitat, cold freshwater habitat, and wildlife habitat. The Sacramento River also has the potential beneficial use of coldwater spawning, reproduction, and/or early development. Table 6.10-1 defines these beneficial uses, among others.

In accordance with the requirements of the federal Clean Water Act (see Section 6.10.3, “Regulatory Setting”), the State Water Resources Control Board (SWRCB) has determined that beneficial uses in the Sacramento River are impaired by high concentrations of diazinon (a pesticide related to agricultural and urban runoff), mercury (related to mining in the upper watershed), and unknown toxicity. Specific beneficial uses and impairments to those uses have not been identified for the system of agricultural canals and drains internal to the Natomas Basin.

Groundwater

The Basin Plan (Central Valley RWQCB 2004) considers all groundwater in the Central Valley Region as suitable or potentially suitable, at a minimum, for municipal and domestic water supply, agricultural supply, industrial process supply, and industrial service supply, unless otherwise designated by the Central Valley RWQCB. These beneficial uses are defined in Table 6.10-1.

Groundwater quality data were collected between 1991 and 1999 from groundwater wells operated by Sacramento Groundwater Authority agencies, and analyzed for levels of total dissolved solids (TDS) (the measurement of minerals in water, derived from contact from rock and soil) and other constituents of concern affecting drinking water. None of the wells with water quality data provided are in the project area; the nearest are located approximately 3.5 miles east of the site. Therefore, no data specific to the project site are available.

However, results of wells closest to the project site showed levels of the various constituents of concern in the groundwater wells sampled to be within primary and secondary drinking water standards (Sacramento Groundwater Authority 2002) (see the discussion of water quality regulations in Section 6.10.3, “Regulatory Setting”).

As mentioned above under “Groundwater Hydrology,” the Natomas Basin is located within the North American Groundwater Subbasin of the Sacramento Valley Groundwater Basin, as delineated in DWR Bulletin 188, *California’s Groundwater* (2003 update) (DWR 2003b, cited in City of Sacramento 2005). An area along the Sacramento River (approximately 6 miles west/northwest of the project site) extending from Sacramento International Airport northward to the Bear River has been found to have high levels of TDS, chloride, sodium,

bicarbonate, manganese, and arsenic. However, the groundwater in the southern part of the groundwater subbasin is otherwise generally characterized as good quality (DWR 2003b).

Table 6.10-1 Applicable Beneficial Use Designations			
Beneficial Use Designation	Applicable to		Definition
	Sacramento River	Groundwater	
Municipal and Domestic Supply		X	Community, military, or individual water supply systems including, but not limited to, drinking water supply
Agricultural Supply	X	X	Farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing
Industrial Process Supply		X	Industrial activities that depend primarily on water quality
Industrial Service Supply		X	Industrial activities that do not depend primarily on water quality including, but not limited to mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization
Contact Water Recreation	X		Recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs
Noncontact Water Recreation	X		Recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities
Warm Freshwater Habitat	X		Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
Cold Freshwater Habitat	X		Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
Wildlife Habitat	X		Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources
Spawning, Reproduction, and/or Early Development	potential		Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish
Source: Central Valley RWQCB 2004			

Other than in the area described above, groundwater in the Natomas Basin and in the vicinity of the project site is generally of good quality. None of the sites within the Sacramento area with significant groundwater contamination issues (the former McClellan and Mather Air Force Bases, an abandoned Pacific Gas and Electric

Company site on Jibboom Street near Old Sacramento, the former Southern Pacific/Union Pacific Railroad rail yards along the American River, and the Aerojet Superfund site) are located in the Natomas Basin (City of Sacramento 2005). Furthermore, as described under “Results of Records Search for Hazardous Materials” in Section 6.9, “Public Health and Hazards,” Wallace Kuhl & Associates (2004) found no records of on-site contamination, including contaminated groundwater wells, during its Phase I ESA for the project site; EDAW also consulted the U.S. Environmental Protection Agency’s (EPA’s) Envirofacts database and found no records of any regulated water dischargers, impaired water bodies or streams, or other indicators of surface or groundwater quality impairment (EPA 2005).

GLOBAL CLIMATE CHANGE

In 2005 and 2006, a greater interest in the potential effects of global climate change on future projects began to emerge, particularly in the context of how global climate change might adversely affect flood protection efforts. Since 2005, after the catastrophic flooding in New Orleans and elsewhere associated with Hurricane Katrina, there has been a heightened national awareness regarding the adequacy, or inadequacy, of flood protection infrastructure in flood-prone areas and the potential connection between global climate change and the magnitude and frequency of extreme weather events. In California, there has been increased interest in flooding susceptibility, focused primarily on the stability of the existing levee system and its ability to withstand catastrophic flood events.

Scientists have identified several ways in which global climate change could alter the physical environment in California (Kiparsky and Gleick 2005, Roos 2005, DWR 2006). These include:

- ▶ increased average temperatures;
- ▶ modifications to the timing, amount, and form (rain vs. snow) of precipitation;
- ▶ changes in the timing and amount of runoff;
- ▶ deterioration of water quality; and
- ▶ elevated sea level.

The consistency of past trends and future projections for each of the above issue areas varies considerably. For example, analysis of precipitation trends in the western United States for the periods of 1930–1997 and 1950–1997 shows increasing precipitation of both periods in most of California and the Southwest (Mote 2005). However, a separate analysis of long-term precipitation and runoff records from throughout California showed the long-term historical trend for statewide average annual precipitation to be relatively flat (no increase or decrease) over the entire record (DWR 2006). Trends and projections related to sea-level rise show much more consistency. An analysis of worldwide tide-gauge data consistently shows a rise in sea level of approximately 0.3–0.6 foot over the past century (IPCC 2001). Tide gauge stations along the coast of California show a similar increase (DWR 2006). Models addressing future sea level conditions consistently project an increase in worldwide average sea level. Typical results are in the range of 0.3–2.9 feet by 2100 (IPCC 2001), although it is acknowledged that more drastic changes could result if extreme shifts in global oceanic or climatic patterns occur.

In regard to the project area, the project site could be directly affected by global climate change as a result of changes in the levels of precipitation. The project site is located approximately 3 miles east of the Sacramento River. Changes in precipitation characteristics could influence the operational stability of the Sacramento levee system if larger, more frequent, or longer storm events occurred such that the levee system could not adequately handle increased flows.

6.10.3 REGULATORY SETTING

HYDROLOGY (DRAINAGE AND FLOODING)

Federal

Federal Emergency Management Agency

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. FEMA administers the NFIP to provide subsidized flood insurance to communities that comply with FEMA regulations to limit development in floodplains. FEMA also issues FIRMs that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. FEMA has established a minimum level of flood protection for new development as the 1-in-100 Annual Exceedance Probability (AEP) (i.e., 100-year flood event). The City and County of Sacramento are participating communities in the NFIP, and therefore all new development must comply with the minimum requirements of the NFIP.

State

There are no state policies related to hydrology that are applicable to the proposed project.

Local

City of Sacramento General Plan

The following goal and policy from the Health and Safety Element of the *City of Sacramento General Plan* are applicable to the proposed project:

Flood Hazards

- ▶ **Goal A:** Protect against flood related hazards wherever feasible.
 - **Policy 1:** Prohibit development of areas subject to unreasonable risk of flooding unless measures can be implemented to eliminate or reduce the risk of flooding.

The following goal and policies from the Public Service and Facilities Element are also applicable to the proposed project:

Drainage

- ▶ **Goal A:** Provide adequate drainage facilities and services to accommodate desired growth levels.
 - **Policy 1:** Ensure that all drainage facilities are adequately sized and constructed to accommodate the projected increase in stormwater runoff from urbanization.
 - **Policy 2:** Coordinate efforts with County Public Works Department and other agencies as appropriate to provide adequate and efficient drainage facilities and connector lines to service the Rio Linda, North Natomas and Laguna Creek areas of the City.
 - **Policy 4:** Require the private sector to form assessment districts and/or utilize other funding mechanisms to cover the cost of providing drainage facilities.

The project's consistency with the City's policies is evaluated in Chapter 5.0, "Project Consistency with Plans and Policies."

LAFCo Policies

The LAFCo Policies, Procedures, and Guidelines document does not contain any policies related to hydrology and water quality.

WATER QUALITY

Federal

EPA is the lead federal agency responsible for water quality management. The Clean Water Act (CWA) is the primary federal law that governs and authorizes water quality control activities by EPA as well as the states. Various elements of the CWA address water quality. These are discussed below. Wetland protection elements of the CWA administered by USACE are discussed in Section 6.13, "Biological Resources."

Water Quality Criteria/Standards

Pursuant to federal law, EPA has published water quality regulations under Title 40 of the Code of Federal Regulations (CFR). Section 303 of the CWA requires states to adopt water quality standards for all surface waters of the United States. As defined by the act, water quality standards consist of designated beneficial uses of the water body in question and criteria that protect the designated uses. Section 304(a) requires EPA to publish advisory water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from the presence of pollutants in water. Where multiple uses exist, water quality standards must protect the most sensitive use. As described in the discussion of state regulations below, the SWRCB and its nine RWQCBs have designated authority in California to identify beneficial uses and adopt applicable water quality objectives.

National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) permit program was established in the CWA to regulate municipal and industrial discharges to surface waters of the United States. NPDES permit regulations have been established for broad categories of discharges including point source municipal waste discharges and nonpoint source stormwater runoff.

Each NPDES permit identifies limits on allowable concentrations and mass emissions of pollutants contained in the discharge. Sections 401 and 402 of the CWA contain general requirements regarding NPDES permits.

"Nonpoint source" pollution originates over a wide area rather than from a definable point. Nonpoint source pollution often enters receiving water in the form of surface runoff and is not conveyed by way of pipelines or discrete conveyances. Two types of nonpoint source discharges are controlled by the NPDES program: discharges associated with industrial activities including construction activities and the general quality of stormwater in municipal stormwater systems. The goal of the NPDES nonpoint source regulations is to improve the quality of stormwater discharged to receiving waters to the maximum extent practicable. The RWQCBs in California are responsible for implementing the NPDES permit system (see the discussion of state regulations below).

Section 303(d) Impaired Waters List

Under Section 303(d) of the CWA, states are required to develop lists of water bodies that would not attain water quality objectives after implementation of required levels of treatment by point source dischargers (municipalities and industries). Section 303(d) requires that the state develop a total maximum daily load (TMDL) for each of the listed pollutants. The TMDL is the amount of the pollutant that the water body can receive and still be in compliance

with water quality objectives. The TMDL is also a plan to reduce loading of a specific pollutant from various sources to achieve compliance with water quality objectives. EPA must either approve a TMDL prepared by the state or disapprove the state's TMDL and issue its own. NPDES permit limits for listed pollutants must be consistent with the waste load allocation prescribed in the TMDL. After implementation of the TMDL, it is anticipated that the problems that led to placement of a given pollutant on the Section 303(d) list would be remediated.

State

In California, the SWRCB has broad authority over water quality control issues, exercising the powers delegated to the state by the federal government under the CWA. Regional authority for planning, permitting, and enforcement is delegated by the SWRCB to the nine RWQCBs as described below. The City and County of Sacramento are located within the jurisdiction of the Central Valley RWQCB.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is California's statutory authority for the protection of water quality. The act sets forth the obligations of the SWRCB and RWQCBs under the CWA to adopt and periodically update water quality control plans, or basin plans. Basin plans are plans in which beneficial uses, water quality objectives, and implementation programs are established for each of the nine regions in California. The Porter-Cologne Act also requires waste dischargers to notify the RWQCBs of such activities by filing Reports of Waste Discharge and authorizes the SWRCB and RWQCBs to issue and enforce waste discharge requirements, NPDES permits, Section 401 water quality certifications, or other approvals.

Water Quality Control Plan for the Sacramento and San Joaquin River Basins

The Basin Plan for the Sacramento River and San Joaquin River Basins adopted by the Central Valley RWQCB (2004) identifies the beneficial uses of water bodies and provides water quality objectives and standards for waters of the Sacramento River and San Joaquin River basins, including the Delta. State and federal laws mandate the protection of designated "beneficial uses" of water bodies. Beneficial uses applicable to the proposed project are listed in Table 6.10-1 in Section 6.10.2, "Environmental Setting."

The Basin Plan contains specific narrative and numeric water quality objectives for a number of physical properties (e.g., temperature, turbidity, suspended solids), biological constituents (e.g., coliform bacteria), and chemical constituents of concern including inorganic parameters and trace metals and organic compounds. Water quality objectives for toxic priority pollutants (i.e., select trace metals and synthetic organic compounds) are included in the Basin Plan and the CTR.

National Pollutant Discharge Elimination System Permits

The SWRCB and Central Valley RWQCB have required specific NPDES permits for a variety of activities that have potential to discharge pollutants to waters of the state and adversely affect water quality. To receive an NPDES permit a Notice of Intent to discharge must be submitted to the Central Valley RWQCB and design and operational best management practices (BMPs) must be implemented to reduce the level of contaminated runoff. BMPs can include the development and implementation of regulatory measures (local authority of drainage facility design) and structural measures (filter strips, grass swales, and retention basins). All NPDES permits also have inspection, monitoring, and reporting requirements.

General Permit for Stormwater Discharges Associated with Construction Activity (General Construction Permit)

The SWRCB adopted the statewide NPDES General Construction Permit in August 1999. The state requires that projects disturbing 1 acre or more of land during construction file a Notice of Intent with the RWQCB to be covered under this permit. Construction activities subject to the General Construction Permit include clearing,

grading, stockpiling, and excavation. Dischargers are required to eliminate or reduce nonstormwater discharges to storm sewer systems and other waters. A Storm Water Pollution Prevention Plan (SWPPP) must be developed and implemented for each site covered by the permit. The SWPPP must include BMPs designed to prevent construction pollutants from contacting stormwater and keep products of erosion from moving off-site into receiving waters throughout the construction and life of the project; the BMPs must address source control and, if necessary, pollutant control.

General Order for Dewatering and Other Low-Threat Discharges to Surface Waters (General Order for Dewatering)

Dewatering during construction is sometimes necessary to keep trenches or excavations free of standing water when improvements or foundations/footings are installed. Clean or relatively pollutant-free wastewater that poses little or no threat to water quality may be discharged directly to surface water under certain conditions. The Central Valley RWQCB has adopted a general NPDES permit, the General Order for Dewatering, for short-term discharges of small volumes of wastewater from certain construction-related activities. Discharges may be covered by the General Order for Dewatering provided either that they are 4 months or less in duration or that the average dry-weather discharge does not exceed 0.25 million gallons per day. Construction dewatering, and miscellaneous dewatering/low-threat discharges are among the types of discharges that may be covered by the permit.

Safe Drinking Water Act

As mandated by the Safe Drinking Water Act (Public Law 93-523), passed in 1974, EPA regulates contaminants of concern to domestic water supply. Such contaminants are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. These types of contaminants are regulated by EPA primary and secondary Maximum Contaminant Levels (MCLs). MCLs and the process for setting these standards are reviewed triennially. Amendments to the Safe Drinking Water Act enacted in 1986 established an accelerated schedule for setting drinking water MCLs.

EPA has delegated to the California Department of Health Services (DHS) the responsibility for California's drinking water program. DHS is accountable to EPA for program implementation and for adoption of standards and regulations that are at least as stringent as those developed by EPA.

Title 22 of the California Administrative Code (Article 16, Section 64449) defines secondary drinking water standards, which are established primarily for reasons of consumer acceptance (i.e., taste) rather than for health issues.

Local

City of Sacramento General Plan

The following goal and policy from the Public Services and Facilities Element of the *City of Sacramento General Plan* are applicable to the proposed project:

- ▶ **Goal A:** Provide and improve water supply facilities to meet future growth of the City and assure a continued supply of safe potable water.
 - **Policy 5:** Provide water service meeting or exceeding State and federal regulatory agency requirements.

The project's consistency with City goals and policies is evaluated in Chapter 5.0, "Project Consistency with Plans and Policies."

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 nonstormwater discharges to the stormwater conveyance system; eliminate discharges to the stormwater conveyance system from spills, dumping, or disposal of materials other than stormwater; and reduce pollutants in urban stormwater discharges to the maximum extent practicable. Nonstormwater discharges are prohibited except where the discharge is regulated under a NPDES permit (see the descriptions of the NPDES in the discussions of federal and state water quality regulations above). 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, are also exempt from this prohibition. Discharges of pumped groundwater not subject to a NPDES permit may be permitted to discharge to the stormwater conveyance system upon written approval from the City and in compliance with the City's conditions of approval.

City of Sacramento Grading, Erosion, and Sediment Control Ordinance

The City 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 postconstruction 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.

City of Sacramento Stormwater Quality Improvement Plan (2004)

The City of Sacramento Stormwater Management Program is a comprehensive program comprising various program elements and activities designed to reduce stormwater pollution to the maximum extent practicable and eliminate prohibited nonstormwater discharges in accordance with federal and state laws and regulations. These laws and regulations are implemented through NPDES municipal stormwater discharge permits. In 1990, the County of Sacramento and the Cities of Sacramento, Folsom, and Galt applied for and received one of the first areawide NPDES stormwater permits in the country and began development of core stormwater management program elements and activities to address local urban runoff water quality problems (City of Sacramento 2004).

An element of the program, the Construction Element (CE), was designed to reduce the discharge of stormwater pollutants to the maximum extent practicable by requiring construction sites to reduce sediment in site runoff and reduce other pollutants such as litter and concrete wastes through good housekeeping procedures and proper waste management.

The CE strategy includes the following components:

- ▶ Ensure each grading permit or improvement plan includes an erosion and sediment control plan detailing erosion, sediment, and pollution control measures to be used during construction of the project.
- ▶ Ensure applicable projects obtain a State General Construction Permit and prepare a SWPPP containing:
 - 1) a vicinity map,
 - 2) a site map,
 - 3) a site-specific listing of potential sources of stormwater pollution,
 - 4) the type and location of erosion and sediment control BMPs to be employed,
 - 5) the name and telephone number of the person responsible for implementing the SWPPP, and
 - 6) a certification/signature by the landowner or authorized representative.

- ▶ Inspect and enforce the project's erosion and sediment control plan, the Grading, Erosion, and Sediment Control Ordinance, and the Stormwater Discharge Control Ordinance.

Another element of the program, the New Development Element (NDE), was designed to specifically control postconstruction urban runoff pollutants from new development or redeveloped areas. The NDE strategy for reducing stormwater pollutants from new development includes (City of Sacramento and County of Sacramento 2000):

- ▶ employing applicable source controls on all projects;
- ▶ employing regional water quality treatment control measures, such as water quality detention basins, for areas of large development (i.e., areas generally greater than 20 acres), where the opportunity exists; and
- ▶ employing on-site treatment control measures for commercial, industrial, and multifamily residential land uses of one acre or more in areas not served by regional water quality control measures.

LAFCo

- ▶ The LAFCo Policies, Procedures, and Guidelines document does not contain any policies related to water quality.

6.10.4 IMPACTS AND MITIGATION

METHOD OF ANALYSIS

Analysis provided in this section is based on information obtained from a drainage study prepared for the proposed project (Wood Rodgers 2005) and the *Guidance Manual for On-Site Stormwater Quality Control Measures* (City of Sacramento and County of Sacramento 2000). Background information from the Sacramento Groundwater Authority's *Summary of Basin Conditions* (Sacramento Groundwater Authority 2002) is also included.

Because the project would not rely on groundwater to serve the proposed development and modeling indicates that the lake/detention basin would require little, if any, support by on-site wells (see Section 6.5, Utilities) impacts on the underlying groundwater basin are not analyzed further in this EIR. The project site is not located near the ocean and as a result would not be subject to flood-related effects associated with a tsunami. Although the project would construct an on-site lake/detention basin, this body of water would be of minimal depth (i.e., 2–8 feet) and limited size (i.e., 39 acres) such that the potential for a seismically induced seiche would be limited and would not result in a substantial flooding on- or off-site. These impacts are not evaluated further in this EIR.

THRESHOLDS OF SIGNIFICANCE

An impact is considered significant, as identified by the State CEQA Guidelines (Appendix G), if the proposed project or alternatives would:

- ▶ violate any water quality standards or waste discharge requirements;
- ▶ 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, siltation, or flooding on- or off-site;
- ▶ create or contribute runoff water that would exceed the capacity of existing or planned stormwater 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 FIRM or other flood hazard delineation map;
- ▶ place within a 100-year flood hazard area structures that would impede or redirect floodflows;
- ▶ expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

IMPACTS AND MITIGATION MEASURES

IMPACT 6.10-1

Construction-related and Operational Water Quality and Erosion Impacts. *Operation of the project would not result in any water quality or erosion impacts because the project would implement design features that would be consistent with the City of Sacramento Stormwater Quality Standards for Development Projects. However, project construction activities (grading, excavation, etc.) could generate sediment, erosion, and other nonpoint source pollutants in on-site stormwater, which could drain to off-site areas degrading local water quality. Further, on-site earthmoving and soil stockpiling activities could result in sheet erosion during rain events. This would be a **potentially significant** impact.*

Grading, earthmoving, excavation and utility installation, infrastructure development, and building construction under the proposed project would disturb the existing vegetation cover, soil, and drainage systems over the entire project site and some off-site areas (e.g., Meister Way overpass, Elkhorn Road, water and wastewater infrastructure). Construction activities would occur on portions of the project site throughout the year over a period of 5–10 years. Therefore, the site would be subject to exposure to wind erosion, rain, and winter stormwater runoff events depending on the season.

Localized erosion hazards are regarded as relatively low because the project site is generally flat and the soil types on the site are known to have little erosion hazard (see Impact 6.10-2 in Section 6.10, “Geology and Soils”). However, intense rainfall and associated stormwater runoff could result in short periods of sheet erosion within areas of exposed or stockpiled soils. If uncontrolled, these soil materials could cause sedimentation and blockage of drainage channels. Further, the compaction of soils by heavy equipment may reduce the infiltration capacity of soils and increase the potential for runoff and erosion.

Construction activities could result in substantial stormwater discharges of suspended solids, turbidity, and other pollutants from the project construction site as contaminated runoff or direct discharges to drainage channels. Construction-related chemicals (fuels, paints, adhesives, etc.) could be washed into surface waters by stormwater runoff. The deposition of pollutants (gas, oil, carbons) onto the ground surface by construction vehicles could similarly result in the transport of pollutants to surface waters by stormwater runoff or in seepage of such pollutants into groundwater. Increased turbidity could result in adverse impacts on fish and wildlife, reduced water pump life because of abrasion, and increased municipal water treatment costs for sediment removal. Long-term effects could include increased flooding hazards caused by reduced drainage facility and channel capacity.

Nonstormwater discharges could result from activities such as construction dewatering procedures, or discharge or accidental spills of hazardous substances such as fuels, oils, concrete, paints, solvents, cleaners, or other construction materials. Because of the shallow groundwater conditions on-site, construction dewatering activities are likely to be necessary during excavation activities deeper than 5 feet (Wallace Kuhl & Associates 2002). Potential disposal options for the dewatering discharges include land application with subsequent evaporation and percolation back to the groundwater, use for dust control practices, or direct discharge to the existing or

constructed stormwater drainage channels. Dewatering discharges may contain elevated levels of suspended sediment or other construction-related contaminants.

Water quality would not deteriorate postconstruction or during operation of site-specific land uses as a result of implementation of required City of Sacramento Stormwater Quality Standards for Development Projects (May 18, 2006). Specifically, stormwater quality source controls, such as storm drain signage at outdoor storage areas and within loading/unloading areas, would be implemented on-site by individual development projects to prevent the degradation of the water quality runoff. With implementation of required source controls, water quality impacts during operation of the project would be less than significant.

Because the project could result in the substantial increase in stormwater discharges and could result in the discharge of pollutants to on-site stormwater from proposed construction activities, the project would result in *potentially significant* construction-related erosion and water quality impacts.

Mitigation Measure 6.10-1: (City of Sacramento)

- a. The project applicant shall demonstrate compliance through its grading plans with all requirements of the City's Grading, Erosion, and Sediment Control Ordinance (Title 15, Chapter 15.88 of the City Code) including preparing erosion, sediment, and pollution control plans for each construction phase and postconstruction, if necessary. The project's grading plans shall be approved by the City of Sacramento, Department of Utilities.
- b. The project applicant shall demonstrate compliance through its grading plans with all requirements of the City's Stormwater Management and Control Code (Chapter 13.16 of the City Code), which regulates stormwater and prohibits nonstormwater discharges except where regulated by an NPDES permit. The project applicant shall implement measures including the use of soil stabilizers, fiber rolls, inlet filters, and gravel bags to prevent pollutants from being carried off-site in stormwater generated on the project site. These measures shall be designed to accommodate stormwater discharges associated with proposed measures that would be implemented to control on-site dust generation (e.g., wheel washing, active watering).
- c. The project applicant shall consult with the Central Valley RWQCB to acquire the appropriate regulatory approvals that may be necessary to obtain Section 401 water quality certification, SWRCB statewide NPDES stormwater permit for general construction activity, Central Valley RWQCB NPDES permit for construction dewatering activity, and any other necessary site-specific waste discharge requirements.
- d. As required under the NPDES stormwater permit for general construction activity, the project applicant shall prepare and submit the appropriate Notice of Intent and prepare the SWPPP and other necessary engineering plans and specifications for pollution prevention and control. The SWPPP and other appropriate plans shall identify and specify the use of erosion sediment control BMPs, means of waste disposal, implementation of approved local plans, nonstormwater management controls, permanent postconstruction BMPs, and inspection and maintenance responsibilities. The SWPPP shall also specify the pollutants that are likely to be used during construction and that could be present in stormwater drainage and nonstormwater discharges. A sampling and monitoring program shall be included in the SWPPP that meets the requirements of SWRCB Order 99-08-DWQ to ensure the BMPs are effective.
- e. Construction techniques shall be identified that would reduce the potential runoff, and the plan shall identify the erosion and sedimentation control measures to be implemented. The SWPPP shall also specify spill prevention and contingency measures, identify the types of materials used for equipment operation, and identify measures to prevent or clean up spills of hazardous materials used for equipment operation and hazardous waste. Emergency procedures for responding to spills shall also be identified. BMPs identified in the SWPPP shall be used in subsequent site development activities. The SWPPP shall identify personnel training requirements and procedures that would be used to ensure that workers are aware of permit requirements and proper installation

and performance inspection methods for BMPs specified in SWPPP. The SWPPP shall also identify the appropriate personnel responsible for supervisory duties related to implementation of the SWPPP. All construction contractors shall retain a copy of the approved SWPPP on the construction site.

- f. The project applicant shall prepare and submit a Notice of Intent and acquire authorization for a Central Valley RWQCB NPDES permit for construction dewatering activities that may be necessary for foundation and utility installations within the project site.

Significance After Mitigation

With implementation of the above measures, the project's construction-related water quality and erosion impacts would be reduced to a ***less-than-significant*** level because sufficient measures would be in place to prevent the release of pollutants in stormwater off-site and would minimize to the maximum extent practicable erosion of on-site soils.

IMPACT 6.10-2

Potential Exceedance of Drainage System Capacity. *The proposed project includes a lake/detention basin component that has been sized to meet the stormwater drainage needs of the project. Proposed stormwater discharges would exceed the pumping capacity of RD 1000's drainage network. However, improvements to RD 1000's pumping capacity have been required by this DEIR that would increase RD 1000's pumping capacity sufficiently to serve project-generated stormwater drainage. (See Mitigation Measure 6.5-5.) Therefore, this impact would be less than significant.*

The proposed project would include a 39-acre lake/detention basin, outfall structure, and gravity storm drain systems. A preliminary design of the on-site storm drainage system was developed consistent with City requirements. The project site would be graded to create building pads and streets that would provide positive drainage to the lake/detention basin. The drainage system would allow drainage to flow under I-5 through three existing 5-foot by 8-foot box culverts and two proposed 78-inch reinforced concrete pipes that are to be constructed under the Metro Air Park project into an RD 1000 canal outside the project area and, from there, into the West Drainage Canal (Exhibit 6.5-2). With this drainage system, outfall runoff to the existing RD 1000 drain system would have a peak discharge value, set by RD 1000, of 0.1 cfs/acre (Wood Rodgers 2005). Pipes associated with the on-site storm drainage system would be of sufficient size to provide approximately 2 feet of freeboard (vertical distance) below the proposed grading and from the maximum 100-year elevation in the lake/detention basin (Wood Rodgers 2005).

Under the proposed project, existing culverts in the northeastern and southeastern corners of the site would remain in place. In addition, the Lone Tree Canal would remain on the western boundary of the site. With construction of the lake/detention basin, Lone Tree Canal would no longer serve as one of the primary drainage outlets for the project area; however, it would continue to carry runoff from the 540-acre off-site watershed north of the project site. Because the Lone Tree Canal would pass within 250 feet of the nearest houses on the west side of the project area, Wood Rodgers (2005) modeled the hydraulic capacity of the canal under project conditions. Following construction of the future Metro Air Park project immediately to the west of the project site, it is expected that Metro Air Park would discharge to Lone Tree Canal near the southwestern corner of the project site. Therefore, outflow from the future Metro Air Park was included in the modeling of hydraulic capacity of the Lone Tree Canal under the proposed project, using the 100-year peak pump outflow (270 cfs). The modeling showed the 100-year storm flows from the off-site watershed north of the project site and from Metro Air Park, west of the project site. Using the 100-year peak pump outflow from Metro Air Park in the modeling was a conservative approach that generated higher water surface elevation than would likely occur (Wood Rodgers 2005). Nonetheless, even under these conditions, sufficient freeboard (2.5 feet)

would be provided between the Lone Tree Canal and housing pads on the west side of the project site (Wood Rodgers 2005).

Further, as indicated above, the future Metro Air Park plans to improve storm drainage at the I-5 undercrossing by adding two 78-inch reinforced concrete pipes adjacent to the three existing 5-foot by 8-foot box culverts. Addition of these reinforced concrete pipes would result in more efficient flow of drainage from the project area. Even if these pipes are not installed, drainage would be sufficient for the project site; modeling by Wood Rodgers (2005) of the 100-year storm without the proposed pipes indicated that the water surface would be higher than under existing conditions in the area immediately upstream of the I-5 undercrossing, but that hydraulic conditions on the project site and in the Lone Tree Canal would not change (Wood Rodgers 2005).

The proposed lake/detention basin would be designed to City and RD 1000 standards in accordance with the requirements set forth in the North Natomas CDP. Further, the applicant would be required to increase the pumping capacity of RD 1000's Plant #3 (see Mitigation Measure 6.5-5). Therefore, runoff from the project site would not have an adverse effect on the capacity of the RD 1000 system. (Wood Rodgers 2005.)

For these reasons, the project's drainage system impacts would be *less than significant*.

No mitigation is required.

IMPACT
6.10-3

On-Site Flooding Risk from Potential for Levee or Dam Failure. *The project site would be threatened by potential levee failure associated with a 100-year flood event for an interim time period, until levee improvements proposed by SAFCA are implemented. Because the extended timeframe for levee improvements could expose on-site residents to flooding from the 100-year event, impacts related to on-site flooding risks from potential levee failure are considered a potentially significant impact.*

The project site is not located within a designated 100-year floodplain as currently delineated by FEMA. Because the project site is currently certified for 100-year flood protection, the project would result in less than significant flooding impacts.

The site is protected by a series of reservoirs including Shasta, Oroville, Black Butte, New Bullards Bar, and Folsom Dam, which were designed to reduce flood flows in the American River and Sacramento River to a rate that could be safely carried by the downstream levees. Over the years coordinated reservoir operations and Folsom Dam outlet enlargement projects have been pursued and authorization of funds for a planned "mini-raise" of the dam has been secured to ensure that Folsom Dam can continue to safely manage runoff from the Sierra Nevada during winter storms.

The levees protecting the Natomas area were found to meet FEMA criteria for 100-year flood protection under a levee evaluation conducted by USACE in 1998. SAFCA recently completed the draft final NLES report (Natomas Levee Evaluation Report) which updates previous studies and evaluates the flood protection level of the Natomas levee system. Although previous studies of these levees concluded that they provided sufficient protection against 100-year storm events, the new SAFCA draft report NLES concludes that some portions of the levee system would be subject to underseepage and erosion hazards during a 100-year storm event. In response to this report, USACE issued a letter indicating that it "can no longer support its original position regarding the certification of the levees in the Natomas area." While official proceedings to decertify the Natomas area levees have not been completed as of the publication of this document, there is evidence to suggest that the Natomas area levees currently do not meet USACE 100-year flood protection criteria. While awaiting the USACE and DWR review of this

draft report, SAFCA has initiated the preparation of studies and environmental documents that would accomplish two objectives: (1) address specific threats to levee integrity to preserve 100-year flood protection designations; and, (2) eventually provide protection from a 200 year storm event. These improvements include levee raising for certain segments of the levee system, construction of slurry walls, and toe rock and bank vegetation. In addition, SAFCA is evaluating whether to construct installation of a new secondary setback levee approximately 1,000 feet from the existing levee located along the upper 5 miles of the east levee of the Sacramento River.

Although the project site is located within the flooding area of concern as identified in the SAFCA Natomas Levee Evaluation Report, the project site is not currently located within a FEMA designated 100-year floodplain. For purposes of full disclosure, this DEIR has presented the latest information available regarding the status of flood protection studies within the Natomas Basin. However, these studies and the recommendations contained therein are ongoing and subject to change and further refinement. As such, this DEIR relies upon existing adopted information (e.g., FEMA certifications) As currently described in those studies, SAFCA is proceeding with implementation of necessary levee improvements to correct existing deficiencies within portions of the Natomas levee system, which are anticipated to be constructed within the next 2–5 years should funding become available. Proposition 1E, Disaster Preparedness and Flood Prevention Bond Act of 2006, was recently passed during the November 6, 2006 election. This act authorizes the State to sell approximately \$4.09 billion in general obligation bond that would be used for various flood management programs including: programs to evaluate, repair, and restore existing levees in the State’s Central Valley flood control system; funding to local governments for the State’s share of costs for locally sponsored, federally authorized flood control projects outside the Central Valley system; grants to local agencies outside of the Central Valley system for projects to manage stormwater; and to protect, create, and enhance flood protection corridors, including flood control bypasses and setback levees. Funding secured through Proposition 1E could be used to implement flood control improvements envisioned by SAFCA. With implementation of these improvements it is expected that superior flood protection (i.e., protection from 200-year storm events) would be provided at the site. However, the project site would be threatened by potential levee failure associated with a 100-year flood event for an interim time period, until levee improvements are implemented. SAFCA intends to construct levee improvements by 2009–2012, but a funding program has not yet been established. An EIR is being prepared to evaluate the levee improvements, and possible funding programs. This EIR is expected to be circulated in winter 2006. Until a program is adopted, the timing of improvements cannot be assured. Once the levee improvements are made, it would be expected that the levees would provide at least 100-year flood protection. If development on the Greenbriar site occurs before levee improvements, residents would be subject to potential flood hazards from the 100-year flood, which is the same as the rest of the developed Natomas area north of the American River.

Proposed levee and streambank erosion improvements could result in significant biological and cultural resource impacts, construction-related air quality and noise impacts, and land use impacts (associated with new setback levee). Because the project site is located in an area at risk of flooding resulting from a levee failure in the Natomas Area, the project would contribute to the need for proposed levee improvements and would contribute to the *potentially significant* construction-related environmental impacts that would occur with implementation of the improvements. While mitigation would be recommended as part of the environmental document that evaluates these improvements and would reduce these potential impacts, it is unknown whether these impacts would be reduced to a less-than-significant level.

Because the timeframe for levee improvements could expose on-site residents to flooding from the 100-year event impacts related to on-site flooding risks from potential levee failure are considered a *potentially significant* impact.

Regarding global climate change, the project area could be directly affected by changes in precipitation patterns (e.g., increased number of events, greater magnitude events). The project area could be subject to local or regional flooding as a result of its proximity to the Sacramento and American Rivers. SAFCA is the agency responsible for implementing the necessary flood control improvements to protect the project area from catastrophic flood events. SAFCA, in coordination with other state and federal agencies (e.g., USACE, DWR), determines the necessary level of flood protection based on available data regarding precipitation, snowpack, geotechnical standards for levees, and hydrological data for our local surface and groundwater systems. Based on these data, SAFCA implements the necessary improvements to provide sufficient flood protection to area residents. As described above, SAFCA is currently proceeding with implementation of the necessary improvements to provide a 200-year level of flood protection within the Natomas area. Further, SAFCA is proceeding with the evaluation of an assessment district fee program and development fee program that would collect monies to implement the necessary improvements to the local levee system and conditions change in the future. SAFCA is the agency responsible for identifying the appropriate flood protection measures to protect residents from flood hazards and would continue to implement new flood protection measures as conditions change, including changes resulting from global climate change. As a result, flooding impacts on the project area as a result of global climate change are expected to be addressed through SAFCA's flood protection program and are described above. It would be speculative to assert whether or not SAFCA would provide for adequate flood protection from any changes resulting from global warming, as this is an issue that is becoming understood, but is still subject to additional study. No additional analysis of flooding impacts is necessary.

~~Because the project is currently certified for 100-year flood protection by FEMA, the project would result in *less than significant* flooding impacts.~~

Mitigation Measure 6.10-3 (City of Sacramento and LAFCo)

~~a. In the event that levees currently providing adequate flood protection to the project site are decertified and can no longer provide 100-year flood protection as determined by FEMA, the applicant shall implement one of the following mitigation measures. This mitigation measure shall terminate upon the first recertification of the levees by FEMA.~~

The project applicants shall ~~implement one of the following:~~

~~a. b. Raise the building pads of all buildings with the project to a level high enough to remove structures from the 100-year floodplain as identified by FEMA in any such decertification; or~~

~~b. e. Participate in a funding mechanism established by SAFCA for the purpose of implementing levee improvements measures that would provide no less than 100-year flood protection for the project site, or for that portion of the Natomas Basin requiring re-certification for 100-year flood protection including the project site provided that such funding mechanism is (1) based on a nexus study; (2) is regional in nature; (3) is proportionate, fair, and equitable; and (4) complies with all applicable laws and ordinances.~~

Significance After Mitigation

Because the timing and schedule for improvements to levees providing flood protection to the project site are under the purview of SAFCA, there is no other feasible project-specific mitigation available to address on-site

flooding risks from potential regional levee failure. Although levee improvements are scheduled to begin in 2007, the timing for completion of levee improvements is uncertain (planned for 2009–2012) and ultimate implementation of levee improvements is not guaranteed. Because of the unknown timeframe for levee improvements, impacts related to on-site flooding risks from potential levee failure is considered an interim **significant and unavoidable** impact.

As described above, proposed levee and streambank erosion improvements could result in significant biological and cultural resource impacts, construction-related air quality and noise impacts, and land use impacts (associated with new setback levee). Because the project site is located in an area at risk to flooding resulting from a levee failure in the Natomas area, the project would contribute to the need for proposed levee improvements and would contribute to the potentially significant environmental impacts that would occur with implementation of the improvements. While mitigation would be recommended as part of the environmental document that evaluates these improvements would reduce these potential impacts, it is unknown whether these impacts would be reduced to a less-than-significant level. Therefore, **potentially significant and unavoidable** construction-related impacts could occur with implementation of the proposed levee improvements and the project would result in a considerable contribution to these impacts.

~~The project's flooding impacts would be **less than significant** with or without implementation of the above mitigation measure. The proposed mitigation measure would further reduce this less than significant impact and would ensure that adequate flood protection would be provided at the project site in the event that portions of the local levee network are decertified by FEMA.~~

**IMPACT
6.10-4**

Result in an On-site Flooding Hazard. *Project implementation would increase the amount of impervious surfaces on-site and would increase surface runoff and the need for discharge to the West Drainage Canal. However, the proposed project includes a stormwater runoff collection system sufficient to protect the project site during a 24-hour and 10-day 100-year flood event and avoid increases in off-site flooding. Therefore, development of the project site would not result in an on-site flooding hazard. This impact would be **less than significant**.*

Project development would increase the amount of impervious surfaces (e.g., buildings, paved roadways, parking surfaces), which would increase both the total volume and peak discharge rate of runoff generated on the project site, thus requiring the installation of a high-capacity storm drain system. Project development would increase the rate of stormwater discharges to the Natomas West Drainage Canal. The project would also receive stormwater flows from lands to the north of the project site, which would need to be conveyed through the project's stormwater system.

The proposed project includes a stormwater runoff collection system sufficient to protect the project area during a 24-hour and 10-day 100-year flood event (Wood Rodgers 2005). This system would be built in accordance with City standards and, as described in Impact 6.10-2 above and depicted in Exhibit 6.10-3, would have adequate capacity to safely convey stormwater runoff through and off the project site without resulting in on-site or off-site flooding. Site grading would achieve a site balance while providing an overland release for storm drainage that exceeds the capacity of the underground storm drainage system. Residential lots and street drainage runoff would be directed to drain inlets while providing overland release points. Residential pads would be set above the 100-year surface elevation to prevent drainage from reaching the building pad envelope (Wood Rodgers 2005). Further, the project would not result in the construction of any large buildings that would have the potential to impede or redirect flood flows. Lands to the north of the project site would convey stormwater flows to the project site; however, because of capacity constraints in Lone Tree Canal north of Elkhorn Boulevard, during a 100-year storm event spillage of stormwater flows on to the project site could occur, resulting in localized flooding. This impact would be **potentially significant**.

Mitigation Measure 6.10-4: (City of Sacramento and LAFCo)

- a. The project applicant shall submit grading plans to the City Department of Utilities that demonstrate that Elkhorn Boulevard has been sufficiently raised to provide 1 foot of freeboard above Lone Tree Canal during a 100-year storm event. Approximately 1,800 linear feet of Elkhorn Boulevard would need to be raised to provide sufficient localized flood protection.
- b. The project applicant shall submit drainage and infrastructure plans to the City Department of Utilities that provide for the installation of a 48-inch culvert in Lone Tree Canal at Elkhorn Boulevard. Construction of this improvement could result in impacts on riparian and other native habitat; impacts on biological resources including giant garter snake habitat, and construction-related air quality (NO_x, PM₁₀), noise, transportation, and stormwater quality impacts. These impacts would be mitigated to less-than-significant levels with implementation of mitigation recommended for the project and presented in this Draft EIR. As a result, no new significant environmental impacts would occur with implementation of this improvement.

Significance After Mitigation

With implementation of the above mitigation measure, the project's on-site flooding impacts would be reduced to a less-than-significant level because the project site would be graded to ensure that all stormwater flows would be conveyed to appropriate drainage facilities and these drainage facilities would be sized to accommodate on- and off-site stormwater flows.

7 OTHER CEQA-REQUIRED ANALYSES

As described in Chapter 1, “Introduction,” this recirculated draft environmental impact report (RDEIR) includes only those sections that contain significant new information from that published in the DEIR (July 2006). The air quality and hydrology, drainage, and water quality sections of the DEIR have been recirculated in this document. To the extent that information and analysis for the project have changed, changes to the cumulative analysis are described below. Changes to the text of the DEIR are identified by underline for additions and ~~strikeout~~ for deletions.

7.1 GROWTH-INDUCING IMPACTS

7.1.1 INTRODUCTION

Cumulative impacts are defined in California Environmental Quality Act Guidelines (State CEQA Guidelines) Section 15355 as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” A cumulative impact occurs from “the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time” (State CEQA Guidelines Section 15355[b]).

According to Section 15126.2(d) of the State CEQA Guidelines, an environmental impact report (EIR) must discuss the growth-inducing impacts of the project. Specifically, CEQA states that the EIR shall:

Discuss 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.

Growth-inducing impacts can result from development that directly or indirectly induces additional growth. Examples of growth inducement include:

- ▶ redesignation of property from agricultural to urban uses within an agricultural area, thus increasing the potential for adjacent farmland to also be redesignated to urban uses;
- ▶ the development of new housing or job-generating uses that would be sufficient in quantity to create a substantial demand for new jobs and housing, respectively;
- ▶ the development of new schools as part of a proposed project with excess capacity to serve adjacent currently undeveloped areas;
- ▶ the extension of roads and utilities to an area not currently served by such infrastructure; and
- ▶ the oversizing of new utility lines to a project site that may have additional capacity to serve currently undeveloped areas nearby.

Growth inducement itself is not an environmental effect but may foreseeably lead to environmental effects. These environmental effects may include increased demand on other community and public services and infrastructure, increased traffic and noise, degradation of air or water quality, degradation or loss of plant or animal habitats, or conversion of agricultural and open space land to urban uses.

7.1.2 CITY/COUNTY NORTH NATOMAS JOINT VISION PLAN

The project site is currently located outside the City of Sacramento (City) and outside the City’s sphere of influence (SOI). The land use maps in the *City of Sacramento General Plan* (City General Plan) and the *County of Sacramento General Plan* (County General Plan) designate the project site for agricultural land uses. As such, based on current land use designations the project site is not identified for future urban development. Development of the project as proposed would be inconsistent with land uses envisioned in the City and County General Plans.

In 2001, the City and the County of Sacramento (County) embarked upon a long-term agreement to collaboratively manage growth and preservation of open space and habitat in unincorporated areas of the Natomas Basin within Sacramento County. The agreement resulted in the preparation of the City/County North Natomas Joint Vision Plan (Joint Vision). This vision indicated that a substantial portion of the Natomas Basin would become urbanized, including the project site. Both jurisdictions determined that it would be mutually beneficial to cooperatively plan for the urbanization of the area because the City and County would share revenues that result from development of the area and any future development would be in accordance with smart-growth principles. The City Council and County Board of Supervisors approved a Memorandum of Understanding (MOU) that outlined a joint vision for land use and revenue sharing principles for Natomas and recognized the City as the agent of development and the County as the agent of permanent open space protection, including farmlands and habitat. The project as proposed would be consistent with urban development patterns and densities envisioned for the Joint Vision area, and is the first property in the area being considered for development since adoption of the MOU.

7.1.3 GROWTH-INDUCING IMPACTS OF THE PROJECT

The project site is located outside the City of Sacramento’s city limit boundaries and outside its SOI boundaries. Project approval would require annexation of the project site into the City of Sacramento and amendment of the City’s SOI boundary. Additionally, the proposed project would be served by the Sacramento Regional County Sanitation District (SRCSD) and County Sanitation District-1 (CSD-1). SRCSD and CSD-1 would be required to amend their SOI boundary, as the project site currently lies outside SRCSD’s and CSD-1’s existing SOI boundary. As discussed above, the City and County General Plans identify agricultural land uses for the project site and proposed land uses would be different than what is currently envisioned.

The Joint Vision plan identifies high-density mixed residential uses for the majority of the project site along with single-family small-lot uses in the southeasternmost portion of the site. Although the proposed project would be consistent with the Joint Vision plan, this plan is conceptual and does not enable or entitle any land uses. The overall development proposed for the project site is similar to urban development envisioned by the City and County, as discussed below. Through development of the project site as envisioned by the Joint Vision (see Section 7.2, “Cumulative Impacts”), the project would be growth inducing because the increased population associated with development would increase demand for goods and services, thereby fostering population and economic growth in the City of Sacramento and nearby communities. More importantly, it would set a precedent for allowing development north of the current City boundaries; this is discussed further below.

Regarding growth inducement, the 1986 North Natomas Community Plan (NNCP) EIR and the 1993 NNCP EIR Supplement found that the development of the NNCP area would have growth-inducing effects. Development of the North Natomas area will continue to have growth-inducing effects on the adjacent areas surrounding the plan area (City of Sacramento 1993). The project is a reflection of that anticipated growth-inducing effect of the

NNCP. The 1986 NNCP EIR and the 1993 NNCP EIR Supplement stated that the magnitude of the growth-inducing effect identified for the NNCP area would be moderated by planning for a realistic jobs-to-housing balance. Although this balance has not yet been realized in the North Natomas community, the land use designations provided by the NNCP are intended to achieve a balance as residential neighborhoods mature and the establishment of commercial services becomes increasingly viable. Whether this balance mutes pressure for growth outside the NNCP, however, remains to be seen.

Development of the project would not substantially contribute to an overall growth-inducing effect because of its specific location and the nature of the proposed development. The project would be located between residential development occurring in the NNCP area and commercial and industrial development approved for the future Metro Air Park. Because of its adjacency to the NNCP area, the project would extend the North Natomas community to the west. Further, proposed land uses (e.g., residential, commercial, open spaces, school) would complement existing and proposed adjacent land uses.

Roadways providing access to and within the project site would consist of existing roads, improved roads along existing roadway alignments, and new roads. The project would develop and/or improve the road network in the Greenbriar area including Elkhorn Boulevard, Lone Tree Road, and the State Route (SR) 70/99-Elkhorn Boulevard interchange. The proposed project would also construct a new east-west roadway, Meister Way, through the center of the project site to provide access to and from the NNCP area to the east and Metro Air Park to the west. Because of the project site's location (i.e., adjacent to Interstate 5 [I-5] and SR 70/99), the proposed roadway would not provide new or substantially enhanced access to currently undeveloped areas to the south and east. Further, no roadways are proposed to be extended to the north. The proposed Meister Way would only provide connectivity between the approved Metro Air Park development and the existing North Natomas Community. Therefore, the Greenbriar roadway network would not be considered growth-inducing.

Currently, there are no public storm drain facilities that serve the project site or any properties to the north and west. Properties located to the east and south are currently served by a storm drain system operated by the Reclamation District (RD) 1000. A formal stormwater management system is proposed for the project site that would include a series of pipes and detention facilities that would be operated by the City. Proposed stormwater conveyance facilities would not serve (i.e., they would not be sized to handle additional flows from) other development projects outside the plan area, and therefore would not be growth inducing.

The City currently does not provide water service to the project site. The proposed project includes plans for extension of the City's infrastructure from the existing water mains located to the east and south of the site. The extension of water infrastructure to the project site would allow for extending water service to the Metro Air Park development located to the west. However, the Metro Air Park development is an approved development project, and provision of water to Metro Air Park would not be dependent upon water infrastructure constructed to serve the project. Extension of water services to the Greenbriar and Metro Air Park project sites is designed to serve these projects alone and would not induce further growth beyond these projects.

Municipal wastewater treatment service is not currently available to the project site. However, a trunk sewer line, part of SRCSD's wastewater conveyance pipeline system, currently extends across the project site in an east-west direction connecting with Sacramento International Airport and the NNCP area. This trunk line currently conveys wastewater from Sacramento International Airport and would also convey future wastewater generated by the Metro Air Park development to the east. The proposed project would connect to this wastewater trunk line at a point on the easternmost portion of the site. The proposed project would construct the necessary facilities on-site to serve development and connect to SRCSD's conveyance system.

The proposed project would involve a substantial construction effort over an extended period that would bring construction workers to the project site on a daily basis during peak periods. Because construction workers typically do not change where they live each time they are assigned to a new construction site, it is not anticipated that there would be any substantial relocation of construction workers to the City or County of Sacramento

associated with the proposed project. The existing number of residents in the City and County of Sacramento who are employed in the construction industry would likely be sufficient to meet the demand for construction workers that would be generated by the proposed project. Between June and July 2005, the construction industry in Sacramento metropolitan area added 800 new jobs, which accounted for the sixth consecutive month of expansion in the construction industry and brought the construction industry's job total to a new record high (EDD 2005). As of July 2005, there were 73,400 jobs in the construction industry for the Sacramento metropolitan area (EDD 2005). Therefore, no substantial increase in demand for housing or goods and services would be created by project construction workers, and thus no growth inducement associated with these workers would be expected.

In addition, employees would be hired for the proposed elementary school. No employment assumptions for elementary schools in the City of Sacramento were available; based on average school enrollments and average school sizes, Economic & Planning Systems estimated the number of employees per acre for elementary schools at 5.0 employees per acre (Ross, pers. comm., 2005). Based on this estimate, construction of an elementary school on 10 net acres on the project site would result in the creation of 50 full-time equivalent positions employed by the school district. Approximately 850 additional full-time positions would be created by commercial land uses on the project site. It is expected that the proposed project's employment needs would be largely filled by existing Sacramento County or regional residents. Therefore, the proposed project would not be expected to directly induce population growth by bringing substantial numbers of new employees to the project vicinity.

The proposed project would include the development of up to 3,473 residential units with an estimated population of 8,926. Although the proposed project includes the provision of commercial services, on-site services would meet only some of the needs of the project population. The additional population associated with the proposed project would spur an increase in demand for goods and services in the surrounding area and region, which could potentially result in additional development to satisfy this demand. In this respect, the proposed project would be growth inducing. It would be speculative, however, to try to predict exactly where any such new services would locate. The most logical assumption is that they would locate where the existing City and County General Plans currently anticipate them. The general plans have already undergone environmental review and any new individual projects requiring discretionary approvals would undergo their own environmental review if of a scale that warrants environmental review.

Fire, protection, law enforcement, and other City services would be expanded only as necessary to meet project demand. As discussed in Section 6.6, "Public Services," existing law enforcement services have sufficient capacity to serve the proposed project. The City of Sacramento Fire Department (SFD) is planning for the construction of an additional fire station that would serve the project site and surrounding Natomas area. The project would coordinate with SFD and pay required fees to ensure adequate facilities are in place to meet project demands. The project would also provide space for the construction of an elementary school and would pay fees toward funding necessary school facilities. Because adequate public services are available to serve the project or the proposed project would provide or ensure that additional public services would be available to meet project demands (i.e., schools, police, fire), it would not facilitate additional development requiring public services.

The land directly north of the project site is outside the City's SOI boundary and is located in the jurisdiction of the County. This land is designated in the County General Plan for agricultural land uses. Because of this designation and its location outside the City's SOI, the intended long-term use of this property is for agriculture. As the proposed project develops, particularly along its northern edge, it would place urban development adjacent to agricultural land. Historically, this type of land use pattern has resulted in conflicts between the ongoing agricultural operations and the urban development uses. Further, economic returns from urban development are typically substantially higher than continued agricultural use of land, and encroaching urban uses typically make attractive the conversion of adjacent agricultural land to urban uses. Thus, it can be expected that the project would place pressure on agricultural land to the north of the site to convert to urban uses.

Conversion of adjacent agricultural lands to urban uses is not consistent with existing and adopted long-term plans for the area. This potential conversion of agricultural land to an urban use and the related loss of agricultural

land, loss of biological habitat, additional traffic generation, and air and noise impacts are potential growth-inducing impacts of the project. Development in this area would also require the extension of unplanned infrastructure (i.e., water, storm drainage, wastewater). Because development of these agricultural lands would require the County to amend its general plan and/or the City to expand its corporate limits and SOI boundary, such a land use conversion is not assured. Although development of the project, despite not providing any direct infrastructure linkages to the area, may contribute to possible long-term economic pressure for the eventual filing of applications for general plan amendments and/or other discretionary approvals in the area north of the project site, the responses of future elected bodies to such applications cannot be predicted. It is therefore impossible to conclude that the long-term urbanization of this northern area would be a reasonably foreseeable indirect effect of the project. (See State CEQA Guidelines Section 15358, which defines “effects” for purposes of CEQA as including “[i]ndirect or secondary effects which are caused by the project and are later in time or farther removed in distance, but are still *reasonably foreseeable*” [emphasis added].) This said, however, the project’s potential for setting a precedent for growth and extension of the NNCP boundaries is an important consideration. As the NNCP is built out, substantial pressure has been placed to consider development of the area to the north, including the project site. Recent proposals have included consideration of developing the area and using revenues from development to help fund a new sports arena. This proposal did not result in formal application to the City or County, but it suggests that interest in the area is high. Further, under the Joint Vision and the Sacramento Area Council of Governments (SACOG) Blueprint, much of the area is identified as future urban development.

Approval of the project would require the City to expand its sphere of influence to cover the site, which also requires approval of the Sacramento Local Agency Formation Commission (LAFCo). This approval could set precedent for future considerations of growth in the area, but it would also potentially mute such considerations in that LAFCo would not be apt to consider multiple sphere-of-influence changes in rapid succession. Further, ultimate development of the site would require agreement with the U.S. Fish and Wildlife Service (USFWS) because the site, and the rest of the Joint Vision area, is not permitted for development in the Natomas Basin Habitat Conservation Plan (NBHCP). Thus, additional requests for development would be closely scrutinized by USFWS. In short, the precedent-setting nature of the project itself may make other development requests more difficult to process.

Overall, the proposed project would be growth inducing because the increased population associated with the proposed project would increase demand for goods and services, thereby fostering population and economic growth in the City of Sacramento and nearby communities. It can be expected that a successful project would place pressure on adjacent areas to the north to seek development entitlements. As explained above, however, it would be speculative to assume that these areas would in fact develop with urban uses, and numerous discretionary actions subject to environmental review and political considerations would have to be granted before any such urban uses could materialize. In summary, much of the growth that the proposed project would induce has been evaluated and provided for in the City General Plan, County General Plan, and other relevant planning documents.

7.2 CUMULATIVE IMPACTS

This draft environmental impact report (DEIR) provides an analysis of overall cumulative impacts of the project taken together with other past, present, and probable future projects producing related impacts, as required by Section 15130 of the State CEQA Guidelines. The goal of such an exercise is twofold: first, to determine whether the overall long-term impacts of all such projects would be cumulatively significant; and second, to determine whether Greenbriar itself would cause a “cumulatively considerable” (and thus significant) incremental contribution to any such cumulatively significant impacts. (See State CEQA Guidelines Sections 15130[a]–[b], Section 15355[b], Section 15064[h], and Section 15065[c]; and *Communities for a Better Environment v. California Resources Agency* [2002] 103 Cal.App.4th 98, 120.) In other words, the required analysis intends to first create a broad context in which to assess the project’s incremental contribution to anticipated cumulative impacts, viewed on a geographic scale well beyond the project site itself, and then to determine whether the

project's incremental contribution to any significant cumulative impacts from all projects is itself significant (i.e., "cumulatively considerable" in CEQA parlance).

Cumulative impacts are defined in State CEQA Guidelines Section 15355 as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." A cumulative impact occurs from "the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (State CEQA Guidelines Section 15355[b]).

Consistent with State CEQA Guidelines Section 15130(a), the discussion of cumulative impacts in this DEIR focuses on significant and potentially significant cumulative impacts. State CEQA Guidelines Section 15130(b), in part, provides the following:

The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.

7.2.1 PROJECTS CONTRIBUTING TO POTENTIAL CUMULATIVE IMPACTS

The State CEQA Guidelines identify two basic methods for establishing the cumulative environment in which the project is to be considered: the use of a list of past, present, and probable future projects or the use of adopted projections from a general plan, other regional planning document, or a certified EIR for such a planning document. For this DEIR, both the list and the plan approach have been combined to generate the most reliable future projections possible. A list approach is used to define specific projects that are currently proposed, but are not necessarily considered within an approved planning document. The plan approach is used to consider development consistent with an adopted plan. The plan approach is also used to consider the potential cumulative impacts of long-term development of the Joint Vision area, because specific development proposals for this overall area are not yet formed, and the best source for consideration of this area is the SACOG Blueprint, as will be discussed below.

CUMULATIVE CONTEXT

The City of Sacramento has developed over the past 150-plus years beginning in the late 1840s immediately following the discovery of gold. Over this time the City, and the Sacramento region, has shifted largely, though not entirely, from natural habitat to agriculture and urban development. Overall, population in Sacramento County has increased dramatically over the past 65 years, based on U.S. Census data, from approximately 170,000 in 1940 to 500,000 in 1960, 780,000 in 1980, and 1,230,000 in 2000 (California Department of Finance 2005). Over this same period, the City of Sacramento grew from approximately 105,000 people in 1940 to 192,000 in 1960, 276,000 in 1980, and 407,000 in 2000 (California Department of Finance 2005). According to the California Department of Conservation, Sacramento County comprises 636,083 acres, and the amount of urbanized land increased from 131,321 acres in 1988 to 159,903 acres in 2002, a change of 28,582 acres (4.5% of total County acreage) over the reporting period (California Department of Conservation Farmland Mapping and Monitoring Program, 1988–2002 Land Use Summary). The population growth and the related development has changed the environment of the Sacramento region, and this change has resulted in the environmental baseline for many of the issues discussed in Chapter 6, such as adverse air quality, diminishing biological habitat, increased traffic, etc.

The North Natomas area of the City of Sacramento is another important indicator of past development. Greenbriar, if approved, would amend the boundary of the NNCP and would be a Special Planning Area (SPA)

within the NNCP subject to its own Planned Unit Development (PUD) guidelines and finance plan. As described further below, the NNCP is an approximately 9,000-acre area of the City that began developing in 1999 and is expected to reach buildout in 2016. The cumulative effects of this buildout are described in the cumulative impact analysis.

RELATED PROJECTS CONTRIBUTING TO CUMULATIVE IMPACTS

CURRENTLY PLANNED AND PROPOSED PROJECTS

North Natomas Community Plan

Development projects in the North Natomas community that have been approved but are yet to be fully built out have been identified and evaluated by the NNCP and the associated environmental review documents. For this reason, the cumulative analysis contained in this EIR focuses on the overall development anticipated in the North Natomas community as projected by the NNCP. Using this approach, this cumulative assessment provides the most conservative and inclusive analysis of past, present, and potential future projects.

The North Natomas community is bounded by Elkhorn Boulevard to the north, I-80 to the south, the Natomas East Main Drainage Canal to the east, and the West Drainage Canal to the west, covering more than 9,000 acres in the northwest portion of the city (see Exhibit 3-2 in Chapter 3) that was predominantly in agricultural use before development. The NNCP provides a long-term vision for the development of the North Natomas community. The environmental consequences from implementation of the NNCP were addressed in the 1986 NNCP EIR (certified by the Sacramento City Council in May 1986) as well as the 1993 Supplement to the 1986 NNCP EIR. Development within the NNCP started in 1999.

There are several development projects that have been approved in the North Natomas community. Some of these projects are fully built out and occupied at this juncture, while others are still in development phases. These projects are generally located to the south and east of the project site and include the Westborough project, Cambay West, Natomas Crossing, Natomas Town Center, Panhandle, and Natomas Creek.

The development projects in the North Natomas community that have been approved but are yet to be fully built out have been identified and anticipated by the NNCP and the associated environmental review documents. For this reason, the cumulative analysis contained in this EIR focuses on the overall development anticipated in the North Natomas community as projected by the NNCP. Using this approach, this cumulative assessment provides the most conservative and inclusive analysis of past, present, and potential future projects.

In 2000, the estimated population for the North Natomas area was 2,002 people, occupying 740 housing units (SACOG 2001). At buildout (year 2016), the NNCP estimates a population of 66,495 in the North Natomas community occupying 33,257 housing units on approximately 9,038 acres, and 72,016 employees; the NNCP area is projected to account for approximately 35% of new housing and 30% of the new jobs in the City of Sacramento at buildout (City of Sacramento 1994). According to the City of Sacramento, development within the NNCP area as of September 14, 2005, includes approval of 12,162 lots for development of residential, commercial, and industrial land uses; approval of 10,801 building permits; approval of 11,599 single-family residential special permits; and approval of 6,003 multifamily residential special permits (City of Sacramento 2005).

According to SACOG projections, there were 14,865 persons living in the NNCP area and 5,368 housing units in the year 2005. SACOG projects 45,040 persons occupying 17,230 housing units in the year 2025 (SACOG 2005). Using these numbers, SACOG projects a growth of 30,175 persons, or 203% increase, and an increase of 11,862 housing units, or 221% increase, by the year 2025.

Metro Air Park

In addition to development anticipated within the North Natomas community, the Metro Air Park development is a newly developing project located adjacent to the Sacramento International Airport and along the westerly edge of the Greenbriar site. The Metro Air Park totals 1,983 acres and has been approved for development of approximately 20 million square feet of office space, light industrial projects, retail and hotel developments, and a golf course on land east of the airport and north of I-5. The project is located in an area that has historically been dominated by agricultural uses. Construction of the Metro Air Park began in September 2003.

West Lakeside

As detailed in the MOU for the City/County Joint Vision for Natomas, the City has been identified as the appropriate agent for planning new growth in Natomas (City of Sacramento and County of Sacramento 2002). An application for development within the Joint Vision area is on file for the West Lakeside project. No other applications for the Joint Vision area have been filed and its future development potential is in the early consideration stage by the City and County. As such, development of the Joint Vision is considered separately in this analysis. The West Lakeside project is a proposal located approximately 0.25 mile south of the project site adjacent to the eastern border of the West Drainage Canal. This project includes the development of 524 residential units, a 10-acre elementary school, and approximately 33 acres of open space land uses (e.g., parks and detention basins).

Habitat Conservation Plan–Related Development Considerations

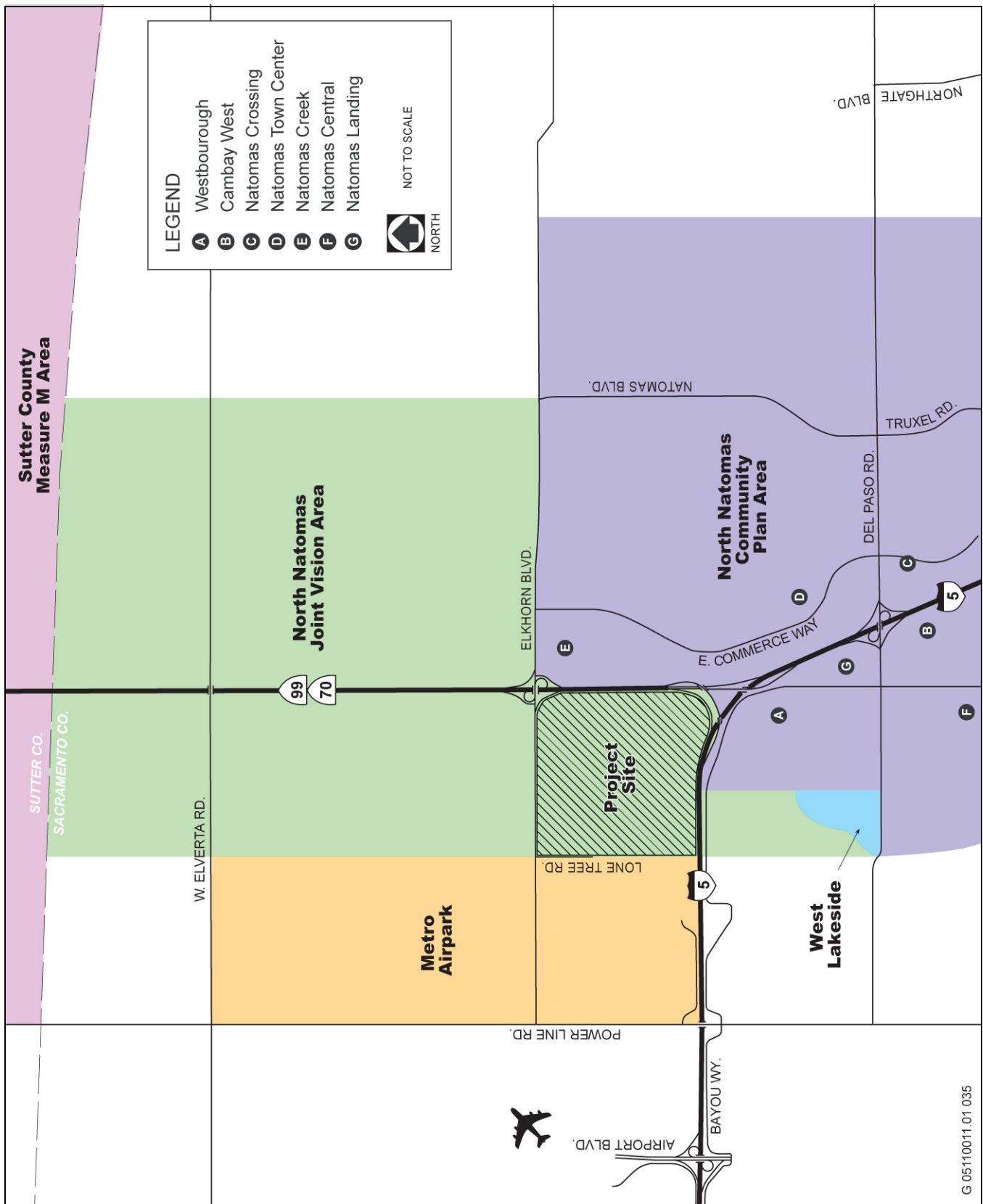
Several regional habitat conservation planning efforts are also under way that allow for development, while setting aside, enhancing, and protecting habitat for sensitive species found in the region. The NBHCP would include the protection, management, and monitoring of conservation lands to reconcile the needs of 22 special-status species with planned development in the Natomas Basin, including lands within the City of Sacramento and Sutter County. Implementation of the NBHCP would provide a comprehensive program for the preservation and protection of habitat for threatened and endangered species potentially found on approximately 53,537 acres of undeveloped and agricultural land in northwestern Sacramento County and southern Sutter County. In addition, a habitat conservation plan (HCP) was developed and adopted for the Metro Air Park (described above).

The land that would be authorized for development under the take permits associated with the NBHCP would be 15,517 acres, of which approximately 4,000 acres are currently undeveloped lands within the City of Sacramento, within the NNCP. In combination with the Metro Air Park, this total would reach 17,500 acres allocated among the City, Metro Air Park, and Sutter County. (Although the Metro Air Park is not part of the NBHCP, it was evaluated in the environmental impact report/environmental impact statement [EIR/EIS] for the NBHCP.) Authorized development would include projects sponsored by either private developers or public entities that occur within the permitted area.

SUMMARY OF CURRENTLY PLANNED AND PROPOSED PROJECTS

Table 7-1 provides a summary of the projects considered in the cumulative analysis. Exhibit 7-1 presents the general location of cumulative projects.

Table 7-1 Cumulative Projects				
Cumulative Project	Total Acres	Residential Land Uses (acres/units)	Commercial/Industrial Land Uses (acres)	Population (persons)
North Natomas Community Plan	9,038	3,160/33,257	2,195	66,495
Metro Air Park Development	1,983	0/0	1,983	0
West Lakeside Development	133.4	70/524	0	1,215
Greenbriar Development Project	577	390/3,473	27.5	8,926
Total		3,620/37,254	4,205.5	76,636



TJKM 2005

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Project's Contribution to Potential Cumulative Impacts

Exhibit 7-1

FUTURE POTENTIAL CUMULATIVE PROJECT: CITY/COUNTY JOINT VISION AND SUTTER COUNTY MEASURE M

Joint Vision

As discussed in Section 3.7.2, “North Natomas Joint Vision Area,” the Joint Vision Plan is a collaborative effort between the City and County of Sacramento to develop a vision for the 10,000-acre area of the County between the northern city limits and Sutter County. Concepts for development have been considered and include a mixture of residential densities, an industrial park (in addition to Metro Air Park), and open spaces throughout, including most extensively in the northern extent separating development from the Sutter County boundary. In fact, a large amount of open space is anticipated to be dedicated (for habitat preservation and farmland retention) in this area. To date, no land use plans have been adopted, and all considerations to date have been conceptual.

The City and County’s conceptual vision for growth within this area is generally compatible with the principles outlined in SACOG’s Blueprint (discussed in Section 3.8.3, “Sacramento Region Blueprint”). The preferred vision for growth and development within this area could result in the development of a range of development densities, depending on the development scenario ultimately selected. Under the preferred scenario, two development options are under consideration: (1) No Development in Floodplain Areas; (2) Reclamation of up to 50% of Floodplain Areas if sufficiently protected. The difference between the options would depend upon whether areas within the existing floodplain are brought under 100-year flood protection through the construction of measures (e.g., improved levees, setback levees, elevated building pads) to remove flood hazards. Table 7-2 presents the range of development densities for the options under consideration.

Land Use Category	No Development in Floodplain				Up to 50% of Floodplain is Reclaimed			
	Net Acres	Units	Commercial Square Feet	Jobs	Net Acres	Units	Commercial Square Feet	Jobs
Residential Mixed Use	2,154	38,759	--	--	2,656	47,801	--	--
Commercial/ Employment	186	--	3,255,709	11,772	233	--	4,656,698	16,837
Open Space/ Public	1,453	--	--	--	1,794	--	--	--

Source: City of Sacramento 2005

The Greenbriar site is in the area being considered under the Joint Vision. For comparison purposes and to demonstrate the magnitude of the proposal, development of the Joint Vision would occur over an area approximately 6.5–8.0 times larger than the project site, would develop 10–13 times more houses, and would develop 11–16 times the commercial space proposed by the project.

The ultimate development scenario that would be proposed for the Joint Vision area is not known and likely will not be known within the time this EIR and development are being considered. However, because the development potential of the area is large and it is being actively studied, this EIR includes disclosure of the plan to the extent that it can be known. It is considered as future potential cumulative development, and because this is a speculative development proposal at this time, it is considered separately and less extensively than the cumulative development that is currently planned and proposed (i.e., specific development proposals have been submitted). The Joint Vision plan would be the subject of extensive CEQA review and consideration by the City and County,

neighboring jurisdictions, regulatory agencies including the California Department of Fish and Game (DFG) and USFWS, local service providers and LAFCo, and its likely implementation is best described as unknown.

Measure M

In 2004, Sutter County voters passed Measure M, an advisory measure intended to provide the Board of Supervisors with an indication of how the citizens of Sutter County feel about the types and level of development in the 7,500-acre area of the South Sutter County Industrial/Commercial Reserve. The southern boundary of the Measure M area forms the Sutter/Sacramento County line, approximately 4 miles north of Greenbriar. The vote did not approve any specific development proposals, but did provide guidance on how development may be viewed in the future. Measure M parameters for the South Sutter area are:

- ▶ at least 3,600 acres for commercial/industrial development;
- ▶ at least 1,000 acres for schools, parks, other public uses, and retail; and
- ▶ no more than 2,900 acres for residential development, with a population cap of 39,000.

An application for the Measure M area has not been submitted to Sutter County, as of December 2005 (well after the date of the Notice of Preparation [NOP] for this EIR), so the specifics of any development proposal are not known beyond the parameters outlined above.

7.2.2 CUMULATIVE IMPACT ANALYSIS

TRAFFIC AND CIRCULATION

PLANNED AND PROPOSED DEVELOPMENT IMPACTS

Year 2025 Cumulative Conditions

The analysis of cumulative traffic impacts is presented in Section 6.1, “Transportation and Circulation,” of this EIR. Please refer to that section. As shown, cumulative development would cause a number of roadways, including freeway segments, to operate above capacity levels, which is a significant cumulative impact. In the year 2025 (without project), the following eight intersections are expected to operate unacceptably:

- ▶ SR 70/99 Southbound Ramps and Elverta Road (Level of Service [LOS] F during the a.m. peak hour)
- ▶ SR 70/99 Northbound Ramps and Elverta Road (LOS F during the a.m. peak hour)
- ▶ Elkhorn Boulevard and Lone Tree Road (LOS D and LOS F during the a.m. and p.m. peak hours, respectively)
- ▶ SR 70/99 Northbound Ramps and Elkhorn Boulevard (LOS F during the a.m. peak hour)
- ▶ Metro Air Parkway and I-5 Northbound Ramps (LOS F during the a.m. and p.m. peak hours)
- ▶ Elverta Road and Lone Tree Road (LOS E and LOS F during the a.m. and p.m. peak hours, respectively)
- ▶ Meister Way and Metro Air Parkway (LOS F during the p.m. peak hour)
- ▶ Metro Air Parkway and Bayou Road (LOS F during the a.m. and p.m. peak hours)

The following two roadway segments are expected to operate unacceptably under Cumulative (2025) Conditions:

- ▶ Elkhorn Boulevard west of SR 70/99 Interchange—LOS E
- ▶ Metro Air Parkway north of I-5 Interchange—LOS F

The following five freeway ramps are expected to operate unacceptably under Cumulative (2025) Conditions:

- ▶ SR 70/99 northbound to Elkhorn Boulevard off-ramp—LOS E during the a.m. peak hour
- ▶ I-5 northbound to SR 70/99 northbound off-ramp—LOS E during the a.m. peak hour

- ▶ I-5 northbound to Metro Air Parkway off-ramp—LOS F during the a.m. peak hour
- ▶ I-5 southbound to Metro Air Parkway off-ramp—LOS F during the a.m. peak hour
- ▶ Metro Air Parkway to I-5 southbound loop on-ramp—LOS F during the p.m. peak hour

The following three freeway segments are expected to operate unacceptably under Cumulative (2025) Conditions:

- ▶ I-5 east of Powerline Road—LOS F for the northbound approach during the a.m. peak hour and the southbound approach during the p.m. peak hour
- ▶ I-5 north of Del Paso Road—LOS F for the northbound approach during the a.m. peak hour and the southbound approach during the p.m. peak hour
- ▶ I-5 north of I-5/I-80 Interchange between I-80 and Arena Boulevard Exit—LOS F for the northbound approach during the a.m. peak hour and the southbound approach during the p.m. peak hour

Cumulative Plus Project

Under Cumulative plus Project conditions, the following 14 intersections would operate unacceptably:

- ▶ SR 70/99 Southbound Ramps and Elverta Road (LOS F during the a.m. peak hour)
- ▶ SR 70/99 Northbound Ramps and Elverta Road (LOS F during the a.m. peak hour)
- ▶ Elkhorn Boulevard and Lone Tree Road (LOS D and LOS F during the a.m. and p.m. peak hours, respectively)
- ▶ SR 70/99 Southbound Ramps and Elkhorn Boulevard (LOS E during the a.m. peak hour)
- ▶ SR 70/99 Northbound Ramps and Elkhorn Boulevard (LOS F during the a.m. peak hour)
- ▶ Metro Air Parkway and I-5 Northbound Ramps (LOS F during the a.m. and p.m. peak hours)
- ▶ Elverta Road and Lone Tree Road (LOS E and LOS F during the a.m. and p.m. peak hours, respectively)
- ▶ Meister Way and Metro Air Parkway (LOS E and LOS F during the a.m. and p.m. peak hours, respectively)
- ▶ Meister Way and Lone Tree Road (LOS D and LOS F during both the a.m. and p.m. peak hours, respectively)
- ▶ Meister Way and E. Commerce Way (LOS D and LOS F during the a.m. and p.m. peak hours, respectively)
- ▶ Metro Air Parkway and Bayou Road (LOS F during the a.m. and p.m. peaks)
- ▶ Elkhorn Boulevard and Project Street 1 (LOS D and LOS F during the a.m. and p.m. peak hours, respectively)
- ▶ Elkhorn Boulevard and Project Street 2 (LOS D and LOS F during the a.m. and p.m. peak hours, respectively)
- ▶ Elkhorn Boulevard and Project Street 3 (LOS D and LOS F during the a.m. and p.m. peak hours, respectively)

The following three roadway segments are expected to operate unacceptably under Cumulative plus Project conditions:

- ▶ Elkhorn Boulevard west of SR 70/99 Interchange—LOS F
- ▶ Metro Air Parkway north of I-5 Interchange—LOS F
- ▶ Meister Way west of SR 70/99—LOS E

The following six freeway ramps are expected to operate unacceptably under Cumulative plus Project conditions:

- ▶ SR 70/99 northbound to Elkhorn Boulevard off-ramp—LOS F during the a.m. peak hour
- ▶ Elkhorn Boulevard to SR 70/99 southbound slip on-ramp—LOS E during the p.m. peak hour
- ▶ I-5 northbound to SR 70/99 northbound off-ramp—LOS E during the a.m. peak hour
- ▶ I-5 northbound to Metro Air Parkway off-ramp—LOS F during the a.m. peak hour
- ▶ I-5 southbound to Metro Air Parkway off-ramp—LOS F during the a.m. peak hour
- ▶ Metro Air Parkway to I-5 southbound loop on-ramp—LOS F during the p.m. peak hour

The following three freeway segments are expected to operate unacceptably under Cumulative plus Project conditions:

- ▶ I-5 east of Powerline Road—LOS F for the northbound approach during the a.m. peak hour and the southbound approach during the p.m. peak hour
- ▶ I-5 north of Del Paso Road—LOS F for the northbound approach during the a.m. peak hour and the southbound approach during the p.m. peak hour
- ▶ I-5 north of I-5/I-80 Interchange between I-80 and Arena Boulevard Exit—LOS F for the northbound approach during the a.m. peak hour and the southbound approach during the p.m. peak hour

As shown, the project would contribute considerably to cumulative traffic impacts, increasing the number of intersections, roadway segments, and freeway ramps that operate unacceptably, and exacerbating adverse operating conditions on three freeway segments that would already operate poorly.

The ability to mitigate these impacts is tied to fair-share contributions to regional transportation funds, but these programs are not currently available and, therefore, implementation of the improvements cannot be guaranteed. Further, in some instances, freeway widening would be required, and this is likely not financially feasible or would require right-of-way acquisition that is not available. Please see Section 6.1, “Transportation and Circulation.” Therefore, these impacts are considered cumulatively *significant and unavoidable*.

JOINT VISION AND SUTTER COUNTY MEASURE M CUMULATIVE IMPACTS

As described above, cumulative development would result in significant impacts on a number of roadways, intersections, and freeway segments, which would operate above capacity. Because the land uses are imprecisely defined for the Joint Vision area, traffic impacts can only be roughly estimated. Using trip generation rates that reflect a relative midpoint generation level, it is assumed that residential uses would generate seven daily and 0.7 p.m. peak-hour trips; commercial would generate 50 daily and five peak-hour trips per 1,000 square feet; and employment would generate four daily and 0.5 p.m. peak-hour trips per job. At these rates, the Joint Vision would generate 480,000–635,000 daily and 50,000–65,000 p.m. peak-hour trips. By comparison, the project would generate 41,119 daily and 4,467 p.m. peak-hour trips. This would be a substantial addition of traffic to the regional roadway system, and would further exacerbate cumulative traffic impacts. Because, as described above, the addition of Greenbriar traffic would be considerable, it would also contribute considerably to cumulative impacts associated with development of the Joint Vision, if approved.

The land uses for the Measure M area of South Sutter County have only been discussed within basic parameters. The ultimate land uses and how they are configured will largely influence trip generation and distribution patterns for Measure M, and until plans are proposed, it would be speculative to forecast traffic impacts. Given the magnitude of potential development, which is similar to the Joint Vision, it is likely that substantial additional traffic would be placed on I-5 and SR 70/99, and that traffic impacts would be further exacerbated.

The ability of the project to reduce its contribution to this impact is tied to fair-share contributions to regional transportation funds, but these programs are not currently available. Further, in some instances, freeway widening would be required, and this is likely not financially feasible or would require right-of-way acquisition that is not available. It is expected to contribute considerably to a cumulatively significant unavoidable impact. However, an analysis of traffic from the Joint Vision project would need to be conducted, along with the development of mitigation programs, to determine what the actual cumulative impact would be after mitigation. It is suggested that the City of Sacramento and the County consider a regional transportation fee program to fund regional improvements to the degree feasible.

AIR QUALITY

PLANNED AND PROPOSED DEVELOPMENT IMPACTS

Past development in the Sacramento Valley Air Basin (SVAB) combined with meteorological conditions has resulted in significant cumulative impacts on air quality. As described in Section 6.2, “Air Quality,” the SVAB is in nonattainment status for ozone and small particulate matter (less than 10 microns in diameter, or PM₁₀).

The Sacramento Metropolitan Air Quality Management District (SMAQMD) has established a significance threshold of 85 pounds per day (lb/day) for oxides of nitrogen (NO_x), an ozone precursor, during construction. For respirable particulate matter (PM₁₀), SMAQMD defines a substantial contribution as any project that would add a concentration of 2.5 micrograms (µg) per cubic meter. Modeling by the district has shown that projects that generally disturb more than 15 acres in any one day, even when fully mitigated by the use of dust control, could add 2.5 µg per cubic meter of PM₁₀ to sensitive receptors near a project site.

The proposed project would result in significant and unavoidable construction-related air quality impacts associated with generation of NO_x and PM₁₀, even with implementation of mitigation measures identified in Section 6.2, “Air Quality.” Assuming that all related projects also implement all feasible construction emission control measures consistent with SMAQMD guidelines, construction emissions on some of the related projects may be less than significant, although it is likely that larger projects, such as the Metro Air Park development, would result in significant and unavoidable air quality impacts on their own. This impact cannot be more precisely determined because related projects would develop on their own schedules, some of which are not known. It would, thus, be speculative to try to add together the various projects with their differing and changing schedules. However, given the large scale of development that would occur with the related projects (over 10 times the size of Greenbriar), taken in total and combined with the nonattainment status of the SVAB for ozone and PM₁₀ and other development that would occur in the SVAB, would result in a significant and unavoidable cumulative construction-related air quality impact. Because the project would result in a significant impact from the generation of NO_x and PM₁₀, it would also be expected to contribute considerably to the **significant and unavoidable** cumulative air quality impact.

Long-term emissions from related projects, considered in light of the nonattainment status of the air basin, would also be cumulatively significant. As described in Section 6.2, “Air Quality,” SMAQMD has established thresholds of significance for project operations: 65 lb/day of reactive organic gases (ROG) and NO_x, and a substantial contribution to PM₁₀ (see discussion above). The proposed project would result in significant and unavoidable long-term regional (operational)-related air quality impacts and would exceed the SMAQMD thresholds. It would, therefore, contribute considerably to the cumulative air quality impact. Related projects would similarly contribute, although to a much greater degree. Emissions attributable to the proposed project, cumulative development listed on Table 7-1, and emissions from other reasonably foreseeable future projects in SVAB as a whole, would continue to contribute to long-term increases in emissions that would exacerbate existing and projected nonattainment conditions. Thus, the proposed project would contribute to a **significant and unavoidable** cumulative air quality impact and the project’s contribution would be considerable.

Given that compliance with applicable rules and regulations would be required for the control of stationary-source toxic air contaminant (TAC) emissions, both on-site and off-site, the project’s contribution to long-term cumulative increases in stationary source TAC concentrations would be minor and **less than significant**. All other TAC issues are site specific; the project would not result in a considerable contribution to any regional TAC impacts.

As described in Section 6.2, “Air Quality,” implementation of the proposed project would result in less-than-significant local mobile source carbon monoxide (CO)-related air quality impacts. Carbon monoxide emissions from mobile sources would be anticipated to further decrease under cumulative conditions because of implementation of emissions control technology; thus, 1- and 8-hour CO concentrations for the 2025 cumulative

conditions would not be anticipated to exceed the significance thresholds of 20 parts per million (ppm) and 9 ppm. Consequently, the cumulative impact of the project's contribution to traffic volumes on the local roadway network relative to CO concentrations would be *less than significant*.

With respect to mitigation, the EIR includes all available feasible mitigation to reduce the project's contribution to cumulative construction-related and long-term emission air quality impacts; see Section 6.2, "Air Quality," Mitigation Measures 6.2-1 and 6.2-2. However, while this mitigation would substantially reduce emissions from the project, it is not sufficient to reduce the project's cumulative contribution to below a level that is not considerable. Therefore, the project would contribute considerably to cumulatively *significant and unavoidable* air quality impacts associated with ozone precursors and PM₁₀ during construction and operations.

JOINT VISION AND SUTTER COUNTY MEASURE M CUMULATIVE IMPACTS

Given that the Joint Vision could result in development at a magnitude of more than 10 times the project and the Measure M development could be similar in magnitude as the Joint Vision, they would be expected to further contribute to cumulative significant adverse air quality conditions, especially associated with ozone precursors and PM₁₀ during construction and operations. The Joint Vision and Measure M would, therefore, exacerbate future cumulative conditions, and the project would contribute considerably to these conditions, because it would exceed significance thresholds as described above.

7.2.3 NOISE

PLANNED AND PROPOSED DEVELOPMENT IMPACTS

Construction activities occurring during the daytime hours are exempt from the provisions of the noise ordinance, provided, however, that all construction equipment is required to be fitted with factory-installed muffling devices and maintained in good working order. For the proposed project, it was determined that adherence to these noise regulations would be sufficient to avoid significant construction-noise impacts. Because daytime construction is required under the noise ordinance, it can be reasonably assumed that related projects would include such restrictions. Hence, cumulative noise impacts associated with construction noise sources would be expected to be *less than significant*. Further, construction noise is localized. Thus, if construction activities occur simultaneously, they would likely not result in cumulative impacts unless sites are being developed in close proximity to one another and expose sensitive receptors to significant noise levels at the same time. Because the proposed project would comply with the noise ordinance and because it is not anticipated that the proposed project would combine with any others to produce construction noise at sensitive receptors, it would not contribute to any such significant cumulative noise impacts. This would be a *less-than-significant* cumulative impact.

Likewise, stationary noise (i.e., noise generated by stationary on-site uses) would be localized to those areas of the site where the noise would be detectable, and would not combine with other projects in the region to produce cumulative noise, and this would be a *less-than-significant* cumulative stationary-noise impact.

The one source of noise that would be expected to result in potential cumulative noise impacts is traffic noise. As described in Section 6.3, "Noise," implementation of the proposed project would result in significant long-term traffic-generated noise impacts under Existing plus Project conditions, with several homes being exposed to substantial increases in noise. These impacts would occur at selected off-site sensitive receptors within the County, generally at homes located on Lone Tree Road (south of Elkhorn), Elverta Road (east of Power Line), Power Line Road (between Elkhorn and Del Paso), and Elkhorn Boulevard (between Power Line and Lone Tree), where noise from the project was modeled to increase by more than 4 A-weighted decibels (dBA) community noise equivalent level (CNEL), which exceeds the County's threshold of significance. Given the relative size of related projects and the fact that they would use the same roadways, it is likely that cumulative development would likewise result in similar significant impacts at these sensitive receptors. The project's contribution to the

noise levels at these areas would be considerable and, as described in Section 6.3, “Noise,” mitigation is not feasible. Therefore, the project would contribute considerably to this *significant and unavoidable* cumulative impact.

Further, buildout of the area would result in a noticeable increase in traffic noise on major roadways. For instance, under current conditions, the 65-dBA CNEL contour extends 798 feet from I-5 (west of the SR 70/99 split) (see Table 6.3-1). Under cumulative (with-project) conditions, the noise contour would extend an additional 326 feet from I-5 (Table 6.3-13). The 65-dBA CNEL contour from Elkhorn Boulevard, between Lone Tree and SR 70/99, does not extend outside of the roadway under current conditions; under Cumulative plus Project conditions the 65-dBA CNEL contour would extend 404 feet (modeled) from the roadway. Thus, the combined cumulative increase in traffic from future growth would extend the 65-dBA CNEL contour (and all other traffic noise contours) considerably, and this would affect sensitive land uses in the area. This is considered a significant cumulative traffic noise impact, and the project would contribute considerably to it. Mitigation for this impact would be developed primarily as new development proceeds, resulting in construction of noise walls, berms, etc. Areas that are already developed and do not have these noise attenuation features would be the most vulnerable to increased noise.

Because cumulative noise would be generated by several projects, it may require a regional program to sufficiently fund soundwalls, berms, etc. It is not known if such a program would be feasible to implement. Because mitigation to sufficiently reduce noise at every existing and proposed sensitive receptor may be infeasible, this cumulative traffic noise impact is considered *significant and unavoidable* and the project contribution would be considerable.

JOINT VISION AND SUTTER COUNTY MEASURE M CUMULATIVE IMPACTS

Given that the Joint Vision could result in development at a magnitude of more than 10 times the project and it would contribute substantial new traffic to regional roadways, it would be expected to further contribute to cumulative significant adverse noise generation at sensitive land uses. The Joint Vision would, therefore, exacerbate future cumulative conditions, and the project would contribute considerably to these conditions, because it would exceed significance thresholds as described above. Because potential Measure M development in south Sutter County would be similar in magnitude as the Joint Vision (although traffic patterns would be different), it is likely to contribute even further to cumulative noise impacts. Mitigation would need to be considered once the magnitude of noise impacts is better understood, but it may or may not be feasible. The project’s contribution to cumulative noise would be considerable, and the impact is assumed to be significant and unavoidable.

7.2.4 UTILITIES

PLANNED AND PROPOSED DEVELOPMENT IMPACTS

Cumulative development throughout the City of Sacramento is expected to increase demand for water from 135,576 acre-feet/year (AFY) in 2005 to 242,877 AFY in 2030. Entitled surface water supply would increase from 205,000 AFY in 2005 to 310,800 AFY in 2030 (see Table 6.4-2 in Section 6.4, “Utilities”). Ample surplus water is available over the foreseeable future. Further, no additional water treatment or conveyance facilities would be needed to serve the project. The project would result in a *less-than-significant* cumulative water supply impact.

Regarding wastewater conveyance, Section 6.4, “Utilities,” identified that sufficient capacity is available to convey wastewater to the Sacramento Regional Wastewater Treatment Plant (SRWTP). Further, SRCSD has indicated that capacity would be available to treat project-related wastewater flows (Hedges, pers. comm., 2006). Cumulative development in the SRWTP service area (most of Sacramento County and part of Yolo County) would result in the need to expand the treatment plant, and this expansion is planned and has undergone CEQA

review and approval (the legal adequacy of the EIR is being challenged). The expansion would be timed to proceed before its capacity constraining development. The proposed project would contribute considerably to the need to expand the plant, and the expansion would result in significant air quality impacts from ozone precursors during construction. No other unmitigated significant impacts from plant expansion were identified in the EIR prepared for the plant expansion. However, the project would contribute considerably to a *significant and unavoidable* cumulative impact.

With implementation of the project, no increase in the discharge rate of stormwater runoff from the site from the project would be expected, so the project would not contribute cumulatively to any stormwater runoff impacts from related development. This would be a *less-than-significant* cumulative impact.

On a cumulative basis, adequate electrical and natural gas facilities and services are available to meet project demands because staffs of the Sacramento Municipal Utility District (SMUD) and Pacific Gas and Electric Company (PG&E) have indicated that they would expand their operations on an as-needed basis to meet new demands (Hager, pers. comm., 2005; Schlaht, pers. comm., 2005). No expansion of existing facilities would be required for the project. As a result, the project would not contribute to a significant cumulative electricity and natural gas impact. This would be a *less-than-significant* cumulative impact.

JOINT VISION AND SUTTER COUNTY MEASURE M CUMULATIVE IMPACTS

Development in the Joint Vision area would increase demands for water. Given the availability of water in the City, it is not expected that Joint Vision development would result in significant cumulative water supply impacts. Sutter County has its own water supply system and would not cumulatively affect the availability of entitled water for the City of Sacramento.

Joint Vision development would add to the need for additional wastewater treatment services, which would require expansion as a result of cumulative development (see discussion above). It is unknown if Measure M development would seek connection to the SRWTP, or if it would provide for a different means of treatment, so its contribution to the need to provide expanded local wastewater treatment facilities is not known.

7.2.5 PUBLIC SERVICES

As described in Section 6.5, “Public Services,” of the EIR, the project applicant would prepare a separate financing plan that would establish the necessary funding mechanisms to provide services to the project. A summary of the elements and performance standards of the finance plan is included in Appendix C. The proposed project would fully provide for its increment of necessary public services and would not result in a contribution to any cumulative impacts. As stated in Section 6.5, “Public Services,” of this EIR, no new police, fire, or solid-waste facilities would be required that are not already planned for; sufficient capacity has been determined to exist at proposed on-site and off-site schools, and no long-term shortfall of school services and facilities would result; and the project proponent would pay development impact fees sufficient to mitigate school impacts. For these reasons, the proposed project would result in less-than-significant public services impacts and would not contribute to a cumulative public services impact. This would be a *less-than-significant* cumulative impact.

JOINT VISION AND SUTTER COUNTY MEASURE M CUMULATIVE IMPACTS

Proposed cumulative development, and additionally the Joint Vision and Sutter County Measure M projects, may result in cumulative impacts on various public services, but because the project would not result in an incremental contribution to these impacts, no further analysis is needed under CEQA.

7.2.6 PARKS AND OPEN SPACE

The proposed project would not result in significant impacts on parks and open space. Similarly, development of the cumulative projects would not be expected to result in impacts related to parks and open space because each development would be required to comply with the City's standards for provision of park facilities. The City does, however, have a citywide deficit of neighborhood/community parkland acreage of less than 20 acres (City of Sacramento 2004a). This deficit is a baseline effect and is considered a significant cumulative impact because it has resulted from past development in the City. However, the proposed project would meet the City's Quimby Act parkland dedication requirements (see Section 6.6, "Parks and Open Space") and it would satisfy the proposed project's overall park needs. Because of this, it would not contribute to the cumulative parkland deficit and would, therefore, not contribute considerably to any park impacts. However, conversion of the project site from predominantly agricultural and open space uses to urban development would result in a significant open space impact. The applicant would provide land for in a permanent conservation easement for open space to offset the project's impact to open space resources. While the permanent conservation easement would lessen significant effects, it would only partially offset proposed conversion and no new open space would be made available. As a result, the project would result in a considerable contribution to a *significant and unavoidable* cumulative open space impact.

JOINT VISION AND SUTTER COUNTY MEASURE M CUMULATIVE IMPACTS

Proposed cumulative development, and additionally the Joint Vision and Sutter County Measure M projects, may result in cumulative impacts on parks, but because the project would not contribute to these impacts, no further analysis is needed under CEQA. Further, it is likely that these new projects would meet parkland dedication requirements that would cover their contribution to parkland demand, given that they would be subject to Quimby Act requirements. Development of the Joint Vision and Sutter County M projects would result in the permanent conversion of open space resources. Although, open space resources would be permanently conserved as part of those projects, no new open space areas would be created and conserved lands would only partially offset open space impacts. The project in combination with the Joint Vision and Sutter County M projects would result in a considerable contribution to a *significant and unavoidable* cumulative open space impact and the project's contribution would be considerable.

7.2.7 AESTHETICS

PLANNED AND PROPOSED DEVELOPMENT IMPACTS

Implementation of the proposed project would substantially alter the visual character of the project site through conversion of agricultural land to developed urban uses, resulting in a significant aesthetic impact related to degradation of visual character. Because of the scale and location of the proposed project, there is no feasible mitigation available to address aesthetic resource impacts associated with the conversion of agricultural land to urban development. However, the area to the south and east of the site has been undergoing a visual transformation over the last 10 years, as the NNCP area has converted from predominantly agriculture to a suburbanized setting. The project would result in the extension of this suburban setting. Although design, architectural, development, and landscaping standards are included to ensure that urban development on the project site conforms to certain aesthetic guidelines, there is no mechanism to allow implementation of the project while avoiding the conversion of the local viewshed from agricultural to urban development. Because development in the NNCP area and Metro Air Park has occurred on formerly agricultural land, as would be the case under the proposed project, and West Lakeside development, development of the NNCP would be expected to result in a similar aesthetic impact regardless of implementation of project design guidelines. Therefore, the proposed project would considerably contribute to a significant cumulative impact on aesthetics, and this impact would be *significant and unavoidable*.

JOINT VISION AND SUTTER COUNTY MEASURE M CUMULATIVE IMPACTS

Development in the Joint Vision area would result in the conversion of around half of the 10,000-acre open space between the current NNCP boundaries and the Sutter County line. This conversion would extend even further the change in the viewshed from open space to suburban. This sort of change would be perceived as a regional alteration of open space, and would lend to the overall aesthetic sense that a large part of the formerly rural area north of downtown Sacramento is irretrievably changing to suburban development. This is a cumulatively significant impact. The impact could be reduced by requiring that large areas of open space are retained along I-5 and SR 70/99, and by requiring design features that provide for visually diverse and high quality development. Further, a concept included in the Joint Vision MOU calls for a buffer between development in the Joint Vision area and the boundary with Sutter County. This would help maintain visual buffer so it does not appear that development in Sacramento County is merging with development in Sutter County and community separation would be somewhat maintained.

Development of the Measure M area of Sutter County would convert an additional 7,500 acres and add to the cumulative impact associated with this aesthetic impact. The buffer between Sacramento County and Sutter County would help reduce the sense of cumulative change in aesthetic character, but would not eliminate the overall visual sense of the conversion of the project area from agriculture to suburban development. This is a cumulatively *significant* impact.

The project would contribute considerably to this cumulatively significant aesthetic impact, even though its impact would be substantially reduced through mitigation proposed for the project.

7.2.8 PUBLIC HEALTH AND HAZARDS

PLANNED AND PROPOSED DEVELOPMENT IMPACTS

The proposed project would result in a potentially significant public health and hazards impact related to the potential for health hazards from soils contaminated by previously unknown underground storage tanks (USTs) or by other sources at the former Two Jakes Park site (see Section 6.8, “Public Health and Hazards”). However, any USTs found would be removed and any contaminated soils would be excavated and treated according to County Environmental Management Department (EMD) procedures before the resumption of construction, thus reducing this impact to a less-than-significant level. Similarly, development of cumulative projects would not be expected to result in significant impacts related to public health and hazards that could not be addressed by standard mitigation and remediation measures (City of Sacramento 1993). This would be a *less-than-significant* cumulative impact.

Implementation of the project would place residents within the Sacramento International Airport’s overflight safety zone and would be inconsistent with the safety standards in the Comprehensive Land Use Plan (CLUP) related to the proposed parks and light rail station that fall within the overflight safety zone. Location of these facilities in the airport’s overflight safety zone would increase safety risks associated with aircraft operations. It is important to note that locating a project within an Airport Safety Zone does not suggest that safety impacts would occur; rather, the Airport Safety Zone is an area of elevated safety risk. That is, in the highly unlikely circumstance of a forced landing not on airport property, the Airport Safety Zone is the area where such a forced landing has a greater probability of occurring. Therefore, development located within this area has an elevated risk of a safety hazard, although such a risk remains remote.

Other cumulative development proposed in and near the Airport Safety Zone could add to this cumulative impact. The Metro Air Park project is located within the Airport Safety Zone. The project is the only other project currently being considered that is located within the overflight zone of the airport. These two projects, together, cumulatively increase safety risks from airport overflights. The West Lakeside project, located southeast of the airport, is outside of the Airport Safety Zone even though it is subject to overflights from airport. Given that the

overflight zone defines the maximum extent of defined significant safety risk, the fact that no other projects are within the overflight zone suggests that there are no other projects that contribute to this cumulative impact. As described in Section 6.8, “Public Health and Hazards,” the project’s airport safety hazard impacts would be reduced to a less-than-significant level through implementation of mitigation that requires a wildlife management plan for the on-site lake/detention basin. Therefore, this is a *less-than-significant* cumulative impact and the project’s contribution would be less than considerable.

JOINT VISION AND SUTTER COUNTY MEASURE M CUMULATIVE IMPACTS

Much of the land that is located within the Joint Vision area is also located within the Sacramento International Airport safety zone. However, no specific development locations have been established within the Joint Vision area. Therefore, it is not known if development within the Joint Vision area would add to cumulative impacts associated with the airport overflights and the attendant safety risks. Similarly, the very southern edge of the Measure M area falls within the northern extent of the Airport Safety Zone. However, there is not a specific land use plan for the Measure M area, as yet, so it cannot be determined if any land uses would be located within the overflight safety area. To the extent that land uses may be located within the Airport Safety Zone, such land uses would, in combination with Greenbriar and the Metro Air Park projects, add to cumulative impacts associated with airport safety. Because land uses for both the Joint Vision and Measure M areas have not yet been defined, it would be speculative to state that inconsistent land uses would be located within the Airport Safety Zone. Therefore, there is no conclusion that can be drawn regarding whether there would be increased cumulative impacts associated with development in these areas.

7.2.9 GEOLOGY AND SOILS

The proposed project would result in potentially significant impacts related to exposure of people and structures to seismic hazards, including ground shaking and liquefaction; subsidence or compression of unstable soils; and damage associated with expansive soils. However, these impacts would be reduced to a less-than-significant level with implementation of recommendations included in the preliminary geotechnical report and a comprehensive site-specific geotechnical report for the proposed project. Any residual less-than-significant impacts would be confined to the project site; they would not combine with any geotechnical effects associated with development in other areas. Similarly, development of cumulative projects would not be expected to result in geology and soils impacts that could not be addressed by standard engineering practices (City of Sacramento 1993). In combination, additional cumulative geology and soils impacts would not be anticipated because these effects are typically site-specific. Thus, the proposed project would result in a *less-than-significant* cumulative geology and soils impact.

7.2.10 HYDROLOGY, DRAINAGE, AND WATER QUALITY

PLANNED AND PROPOSED DEVELOPMENT IMPACTS

The proposed project would not result in significant impacts related to hydrology, drainage, and water quality. At the time of publication of the 1993 NNCP EIR Supplement and the subsequent NNCP Update (City of Sacramento 1993, 1996), the NNCP area was located within the 100-year floodplain; thus, development of the NNCP area under the conditions described in the 1993 EIR Supplement and NNCP Update would be expected to result in a significant and unavoidable impact with regard to flooding hazards. However, the North Natomas area was granted 100-year flood protection in 1998 as a result of local flood protection projects, and the significant and unavoidable impact conclusion was no longer valid. ~~As described in Section 6.10, “Hydrology, Drainage, and Water Quality,” of this EIR, and because the project is not located within a designated 100-year floodplain, less-than-significant flooding impacts would occur and the project would not contribute to any cumulative flooding impacts. This would be a *less-than-significant* cumulative impact. Recently, the levees protecting the Natomas Basin have been found to require additional improvements and the U.S. Army Corps of Engineers (USACE) has indicated that it cannot support a determination that the levees meet 100-year flood certification criteria. As a result, the project would place housing in an area subject to potential flooding from 100-year flood events.~~

Mitigation has been recommended that would require the project applicants to contribute fair-share funding toward the installation of improvements identified by the Sacramento Area Flood Control Agency (SAFCA) to provide a 100-year level of flood protection for the Sacramento levee system. However, these improvements would not be in place before the issuance of the project's first occupancy permit. While the improvements, once in place, would reduce the project's flooding impacts to a less-than-significant level, the improvements are under the jurisdiction of SAFCA and not subject to the City's or LAFCo's control. Therefore, it is unlikely that all necessary levee improvements would be in place at the time the project's first occupancy permit would be issued. During the time between issuance of the first occupancy permit and construction of all necessary levee improvements to provide a 100-year level of flood protection, the project could result in a significant and unavoidable interim flooding impact and would contribute considerably to a **significant and unavoidable** cumulative impacts related to exposure to flooding. Because the project would also contribute to the need for levee improvements, it would also contribute to the potential environmental impacts that would occur with implementation of the improvements, some of which would remain significant and unavoidable even with implementation of all feasible mitigation (e.g., construction-related air quality, traffic, noise). As a result, the project would contribute considerably to **significant and unavoidable** cumulative construction-related levee improvement impacts.

JOINT VISION AND SUTTER COUNTY MEASURE M CUMULATIVE IMPACTS

As described above, the project site is located in an area identified at risk to levee failure and would result in a significant and unavoidable interim flooding impact. there is adequate flood protection for development within the project area and the project would not contribute to cumulative impacts. It is not known, and it is beyond the scope of this EIR, to determine if Similarly, any cumulative development within the Joint Vision area and the Measure M area that occurs before completion of all necessary levee improvements that would provide a 100-year level of flood protection would could also be subject to flooding risks. Because this issue is somewhat speculative (see discussion above and Section 15145 of the State CEQA Guidelines), no conclusion can be drawn with respect to whether-Therefore, the project in combination with Joint Vision and Sutter County M cumulative projects would-the proposed project in combination with development of the Joint Vision and Measure M projects result in a significant and unavoidable interim cumulative effects to flooding impact.

7.2.11 AGRICULTURE

PLANNED AND PROPOSED DEVELOPMENT IMPACTS

Approval of the NNCP required that the City of Sacramento adopt a Statement of Overriding Considerations for the significant impact of conversion of agricultural land. The City determined that conversion of farmlands that were once within the boundaries of the NNCP was an acceptable impact and that there were overriding reasons for approval of development of the NNCP. The NNCP, in combination with the proposed West Lakeside project and the Metro Air Park project, would convert a total of 11,100 acres of land, much of it in agriculture. A large amount of this land has already been converted within the NNCP. The proposed project would convert 518 additional acres of Important Farmland at the site (389 acres of Prime Farmland). While the EIR includes mitigation aimed at reducing the potential to cause adjacent land to convert from agriculture to urban uses, and would preserve through permanent conservation easements open space and habitat lands, some of which may be used for agricultural operations, the impact of the conversion of 518 acres of on-site agricultural land is a significant and unavoidable impact. In combination, the proposed project would add to the cumulative loss of farmlands associated with other development in the NNCP, plus West Lakeside. This is considered a significant cumulative impact to which the project would contribute. Because additional feasible mitigation is not available to mitigate the loss of agricultural land, this impact would be **significant and unavoidable**.

JOINT VISION AND SUTTER COUNTY MEASURE M CUMULATIVE IMPACTS

Development of the Joint Vision area would result in an estimated conversion of up to 4,683 acres of open space land to developed uses. Some of the developed uses would include parks, but also would result in a conversion of current land uses. The majority of this land is in agricultural use. Conversion of this amount of agricultural land would be a significant impact. Similarly, the Measure M area would result in the conversion of up to 7,500 acres of land, most of it in agricultural use. The combination of this conversion, in addition to the agricultural conversions described above, would result in substantial loss of agricultural land within the Natomas Basin. This is a significant cumulative impact to agricultural land, and the proposed project would contribute considerably to this impact. There are no mitigation measures available to substantially lessen this cumulatively significant and unavoidable impact.

7.2.12 BIOLOGICAL RESOURCES

Similar to the proposed project, additional development as proposed within the North Natomas community would result in impacts on Swainson's hawk, giant garter snake, riparian/wetland habitat, and agricultural lands/rice fields. The development of the NNCP area and the Metro Air Park in combination with the proposed project would continue to diminish the lands available for biotic resources. The undeveloped lands in this area, as well as South Sutter County, and West Yolo County, serve as prime habitat for a variety of wildlife and vegetation. The continued development of these lands would result in the incremental decline in the number and diversity of plant and animal species, including sensitive species. The project would contribute to this decline. This is a considerable contribution to this *significant* cumulative impact.

In consideration of these impacts, the NBHCP provides a comprehensive program for the preservation and protection of habitat for threatened and endangered species potentially found on approximately 53,537 acres of undeveloped and agricultural land in northwestern Sacramento County and southern Sutter County. The primary component of the conservation strategy for funding habitat reserve acquisition would be the use of mitigation fees to set aside 0.5 acre of habitat land for each acre of development that occurs in the Natomas Basin. Approximately 8,750 acres of land would be acquired or preserved through implementation of the NBHCP. Included within this area is development within the NNCP, which includes all the cumulative projects except for West Lakeside. West Lakeside would require its own habitat conservation strategy, possibly through preparation of an HCP, or through some other similar means. In addition, a HCP was approved for the Metro Air Park. These conservation plans in combination with the mitigation recommended for the proposed project provide a comprehensive preservation, conservation, and minimization strategy, would reduce the severity of these cumulative biological impacts.

In addition to the projects considered for all resource areas in this EIR, other projects are considered in the cumulative impacts for biological resources. These projects are considered for biological resources only because they do not combine with other resource areas (e.g., traffic, agriculture) to produce cumulative effects, or they are already considered in other sections of this EIR (e.g., noise from the expanded airport operations is considered in Section 6.3, "Noise"). Other projects are described below.

SACRAMENTO INTERNATIONAL AIRPORT DEVELOPMENT PLAN

The Airport Development Plan would include the major improvements that are needed at the Sacramento International Airport over a 20-year planning horizon. These improvements are safety, security, and capacity enhancement projects that would enable the Sacramento County Airport System to meet customer service goals at increased levels of activity in passengers, air cargo, and aircraft operations.

The plan is still under development, but the Sacramento International Airport Master Plan Study (PB Aviation 2004) contains a recommended Airport Development Plan that illustrates the type, location, and scale of projects under consideration. Most projects would be within the existing Airport Operations Area (AOA). Outside of the AOA, potential projects include approximately 400 acres of development (parking and commercial development)

on adjacent land along I-5, and approximately 500 acres of development (aviation-related and commercial development) on adjacent land to the north of the AOA.

The recommended Airport Development Plan also would eliminate several waterways, including:

- ▶ 4.4 miles of the drainage ditch north of Elverta Road,
- ▶ 2.0 miles of the drainage ditch west of Powerline Road,
- ▶ 1.0 mile of the canal adjacent to the access road west of Powerline Road, and
- ▶ 0.5 mile of the drainage ditch along Bayou Road.

SACRAMENTO AREA FLOOD CONTROL AGENCY LEVEE UPGRADE PROJECT

To assess the risk of levee failure and to identify potential remedies, SAFCA commissioned the Natomas Levee Evaluation Study in 2005, discussed in more detail in Section 6.9, “Hydrology, Drainage, and Water Quality.” A variety of remedies were proposed for identified problems. Most of these remedies involve levee improvement and bank protection techniques, including construction of cutoff walls within existing levees, placement of toe rock, and revegetation of banks at locations along existing levees that pose erosion problems. The implementation of these remedies could temporarily disturb approximately 30 acres of habitat for covered species.

As a potential remedy, the study also assessed a setback levee along the upper 5 miles of the east levee of the Sacramento River. This levee would be set back about 1,000 feet from the existing levee. Under this alternative the existing levee would continue to confine the river; the new levee would ensure safe containment of a 200-year flood if the existing levee were to fail. The construction of this levee could affect up to 150 acres of habitat for species covered by the NBHCP (EDAW 2005).

NATOMAS MUTUAL WATER COMPANY AMERICAN BASIN FISH SCREEN AND HABITAT IMPROVEMENT PROJECT (ABFSHIP)

The Natomas Mutual Water Company (Natomas Mutual) annually diverts nearly 100,000 acre-feet (AF) of water from the Sacramento River and the Natomas Cross Canal and distributes that water throughout the Natomas Basin. Natomas Mutual is currently planning and designing two new diversions to replace its existing five diversions. These pumps would be located along the Sacramento River near Sankey Road and between Elverta Road and Elkhorn Road, respectively. These new diversions would retain the same pumping capacity of the existing diversions (630 cubic feet per second [cfs]), plus an additional 14 cfs to accommodate the Bolen Ranch, which would then eliminate its existing, independent diversion. The new pumps, however, would be variable-frequency drive pumps that would facilitate the management of water levels throughout the canal system. Other changes to the current infrastructure would include:

- ▶ construction of a new highline canal between the proposed Sankey Diversion along the landside of the Natomas Cross Canal south levee to the existing Northern Pumping Plant;
- ▶ relocation and extension of the existing Vestal Drain adjacent to the new highline canal between RD 1000’s Pumping Plant No. 4 and the new Sankey Diversion site;
- ▶ decommissioning and removal of the existing Verona Diversion Dam and Lift Pumps;
- ▶ additional capacity for the internal re-lift pumps at RD 1000 Pumping Plant No. 3 in place of the removed Riverside Pumping Plant;
- ▶ regrading the Riverside Main Highline Canal from RD 1000 Pumping Plant No. 3 to the existing Riverside Pumping Plant;

- ▶ upgrading of two control structures, the County Line Check and Lift Pump and the Elkhorn Check and Lift Pumps;
- ▶ removing the five pumping plants (two along the Natomas Cross Canal and three along the Sacramento River);
- ▶ regrading the North Drainage Canal from the V Drain to SR 70/99 in order to improve conveyance; and
- ▶ regrading the Elkhorn Main Highline Canal between the existing Prichard Pumping Plant and the existing Elkhorn Pumping Plant.

SACRAMENTO RIVER WATER RELIABILITY STUDY

The Sacramento River Water Reliability Study (SRWRS) was initiated in 2002 by the U.S. Bureau of Reclamation (Reclamation), Placer County Water Agency (PCWA), Sacramento Suburban Water District (SSWD), City of Roseville (Roseville), and the City of Sacramento. Its goal is to develop a water supply plan that is consistent with the Water Forum Agreement (The Water Forum 2000). It would fulfill this goal by providing additional water supply to PCWA for planned urban growth, to SSWD for groundwater stabilization, to Roseville for planned urban growth and a local conjunctive use program, and to the City of Sacramento for water supply reliability and wheeling services with neighboring water purveyors to meet their water supply demands and to reduce their reliance on groundwater. It also would increase the interconnectivity and source redundancy to the water supply system to maximize long-term water supply reliability.

An initial alternatives report has been prepared for this study (Reclamation 2005) that developed four alternatives. These alternatives are:

SRWS Elverta Diversion Alternative. This alternative would consist of a diversion on the Sacramento River with an associated pump station and water treatment plant, and treated water pipelines to water distribution systems of the SRWRS partners. Water pipelines would extend from the Sacramento River across the Natomas Basin along or adjacent to Elverta Road, and from Elverta Road south to the City of Sacramento. Total pipeline length would be approximately 9 miles.

Joint SRWS-ABFSHIP Elverta Diversion Alternative. This alternative would consist of a consolidated diversion on the Sacramento River and associated facilities to accommodate the needs of the SRWRS partners and the NMWC from the Elkhorn Diversion planned under the ABFSHIP. Water pipelines would extend from the Sacramento River across the Natomas Basin along or adjacent to Elverta Road, and from Elverta Road south to the City of Sacramento. Total pipeline length would be approximately 9 miles.

ARPS-Elverta Diversion Alternative. This alternative would consist of facility expansions by PCWA in Placer County, increased use of groundwater by Roseville, and construction of a diversion on the Sacramento River and of associated treatment and transmission facilities by Sacramento. (Under this alternative, Natomas Mutual would construct and operate its planned Elkhorn Diversion independent of the SRWRS, or continue to divert from its existing diversion.) Water pipelines would extend from the Sacramento River along or adjacent to Elverta Road for approximately 5 miles, and from Elverta Road south to the City of Sacramento. Total pipeline length would be approximately 6.5 miles.

ARPS-Joint Sacramento-ABFSHIP Elverta Diversion Alternative. This alternative would include the same facilities as the ARPS-Elverta Alternative plus additional diversion capacity and facilities at the diversion if the ABFSHIP lead agencies select the Sankey/Elkhorn Diversions alternative for the ABFSHIP. Water pipelines would extend from the Sacramento River along or adjacent to Elverta Road for approximately 5 miles, and from Elverta Road south to the City of Sacramento. Total pipeline length would be approximately 6.5 miles.

Each of these projects could combine to result in disturbances to biological resources, particularly aquatic resources. Mitigation would be developed for each of these projects, and to the degree that endangered species are affected, mitigation would be required, by law, to fully mitigate impacts.

Similarly, the Greenbriar project would be required to comply with the federal Endangered Species Act (FESA) and the California Endangered Species Act (CESA). Both of these acts require that impacts on endangered species are minimized and fully mitigated. As described in Section 6.12, "Biological Resources," extensive mitigation is proposed, including the purchase and enhancement of two mitigation sites (Natomas 130 and Spangler), purchase of additional easements for Swainson's hawk habitat, along with establishment of a 250-foot linear open space/buffer along the western edge of the Greenbriar site. Additionally, the project applicant would consult with USFWS and DFG on this mitigation plan, and would incorporate additional mitigation that arises through the consultation process. Taken together, it is expected that this mitigation would lessen the impact of the proposed project on biological resources to the extent that it is not considerable. The project, therefore, would not contribute considerably to a cumulatively significant impact on these biological resources and this would be a *less-than-significant* cumulative impact.

JOINT VISION AND SUTTER COUNTY MEASURE M CUMULATIVE IMPACTS

Development within the Joint Vision area would result in the conversion of up to 4,683 additional acres of open space land that provides various levels of habitat for Swainson's hawk, giant garter snake, and other species that are currently protected by the NBHCP. This is nearly half the acreage within that Joint Vision area. Some of the land within this area has already been set aside as a habitat in compliance with the NBHCP. Additional development within the Joint Vision area would be expected to have adverse impacts on the various species covered by the NBHCP. It is very likely, and expected, that any development within this area would require a new habitat conservation plan, consistent with FESA and the CESA. As described above, compliance with these laws requires that impacts on endangered species are minimized and fully mitigated. However, it must be recognized that this level of additional development would be expected to have residual environmental impacts on the various species in the area. While the extent of potential mitigation for development within this area is not currently known, there is the real potential that cumulatively significant impacts to various of the species could occur. Because the project would result in adverse effects (which would be mitigated), it has the potential to combine with adverse effects from development in the Joint Vision area, and generate cumulatively significant impacts. However, a conclusion on this issue cannot be reached until development is actually proposed in the Joint Vision area.

The Measure M area is located on property that is covered by the incidental take permit issued under the NBHCP. While development of this 7,500-acre area could adversely affect the various species covered by the NBHCP, the impacts would be minimized and fully mitigated through necessary compliance with the terms of the NBHCP.

Overall, development of the project site, the NNCP area, West Lakeside, the Joint Vision area, and the Measure M area would result in development of several thousand acres of habitat and potential habitat. While this development would be subject to the terms and conditions of HCPs, which either are or would be in existence to guide development while minimizing impacts of biological resources, cumulative impacts could occur to sensitive biological resources. That stated, it would be speculative to conclude, without the details of any HCP's, whether the residual impacts would be cumulatively significant.

7.2.13 CULTURAL RESOURCES

Development of the cumulative projects has the potential to result in the discovery of undocumented subsurface cultural resources or unmarked historic-era and prehistoric Native American burials. However, these potential impacts would not increase in severity in consideration of cumulative projects. In addition, the incorporation of standard measures addressing the response when undocumented resources are discovered would address this

potential impact. For these reasons, the proposed project would result in a *less-than-significant* cumulative impact on cultural resources.

7.3 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES THAT WOULD BE CAUSED BY THE PROPOSED PROJECT

CEQA (Public Resources Code Section 21100[b][2]) provides that an EIR shall include a detailed statement setting forth “[i]n a separate section...[a]ny significant effects on the environment that would be irreversible if the project is implemented.” State CEQA Guidelines Section 15126.2(c) provides the following guidelines for analyzing the significant irreversible environmental changes of a project:

Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irretrievable damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

Although the proposed project would use minor amounts of both renewable and nonrenewable natural resources for project construction, this use would not increase the overall rate of use of any natural resource, or result in the substantial depletion of any nonrenewable resource.

The project includes the development of or creation of access to a previously inaccessible area. However, development of the project site would commit future generations to the significant irreversible change of converting the project site from agricultural, which supports both crops and habitat, and open-space use to an urbanized land use. Mitigation for habitat conversion is included in the project and considered in this EIR.

Lastly, the proposed project is not anticipated to result in irreversible damage from environmental accidents, such as an accidental spill or explosion of a hazardous material. During construction, equipment would be using various types of fuel and material classified as hazardous. In the State of California, the storage and use of hazardous substances are strictly regulated and enforced by various local, regional, and state agencies. The enforcement of these existing regulations would preclude credible significant project impacts related to environmental accidents.

7.4 SUMMARY OF SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

This section is prepared in accordance with Section 15126.2(b) of the State CEQA Guidelines, which requires the discussion of any significant environmental effects that cannot be avoided if a project is implemented. These include impacts that can be mitigated but cannot be reduced to a less-than-significant level.

An analysis of environmental impacts caused by the proposed project is provided in Chapter 6 of this EIR. The following is a summary of the impacts that have been determined to be significant and unavoidable:

► *Transportation*

- *Impacts on the Freeway Ramps.* The proposed project would increase traffic volumes on the freeway system and would cause three study freeway ramps (i.e., SR 70/99 northbound/Elkhorn Boulevard off-ramp, SR 70/99 southbound/I-5 southbound off-ramp, and I-5 northbound/SR 70/99 northbound off-ramp) to operate unacceptably under Baseline plus Project Conditions. With implementation of Mitigation Measure 6.1-3b, the SR 70/99 Northbound to Elkhorn Boulevard off-ramp would operate at acceptable levels and this impact would be reduced to a less-than-significant level. However, this ramp is not under the jurisdiction of the City of Sacramento (i.e., subject to California Department of

Transportation [Caltrans] jurisdiction). While the project would contribute funds that would implement measures that would fully mitigate impacts on this ramp to a less-than-significant level, it is unknown whether these measures would be implemented because they are not subject to the control of the City. As a result, for purposes of CEQA impacts on the SR 70/99 Northbound to Elkhorn Boulevard off-ramp (Impact 6.1-3b) would remain ***significant and unavoidable***. Further, no feasible mitigation is available to reduce the project's impacts on the SR 70/99 Southbound to I-5 Southbound on-ramp and the I-5 Northbound to SR 70/99 Northbound off-ramp because recommended mitigation is beyond the control of the project applicant, outside the jurisdiction of the City, and there is no established funding mechanism available for contribution to recommended improvements. Therefore, impacts on these ramps would be ***significant and unavoidable***.

- ***Freeway Mainline Segment Impacts.*** The proposed project would increase traffic volumes on the freeway system and would cause four study freeway mainline segments (i.e., I-5 north of Del Paso Road, I-5 north of I-5/I-80 interchanges between I-80 and Arena Boulevard, SR 70/99 between Elverta Road and Elkhorn Boulevard, and SR 70/99 between Elkhorn Boulevard and I-5/SR 70/99 interchange) to operate unacceptably under Baseline plus Project Conditions. Because no feasible mitigation is available to reduce the project's impacts on study area freeway segments, impacts on these freeway segments would remain ***significant and unavoidable***.
- ***Cumulative Traffic Impacts on Study Area Intersections.*** Traffic volumes associated with the project in combination with other reasonably foreseeable cumulative projects would cause several study area intersections to operate unacceptably and exceed City and County thresholds of significance for intersection operations. The intersections of SR 70/99 Southbound Ramps and Elkhorn Boulevard, SR 70/99 Northbound Ramps and Elkhorn Boulevard, and Metro Air Parkway are not under the jurisdiction of the City of Sacramento (i.e., subject to Caltrans jurisdiction). While the project would contribute funds that would implement measures that would fully mitigate impacts on these intersections to a less-than-significant level, it is unknown whether these measures would be implemented because they are not subject to the control of the City. As a result, for purposes of CEQA, cumulative impacts on these intersections would be considered ***significant and unavoidable***.

Further, no feasible mitigation is available or implementation of feasible mitigation cannot be guaranteed because it is not subject to the control of the City for the intersections of Elkhorn Boulevard and Lone Tree Road, Meister Way and Metro Air Parkway, Meister Way and Lone Tree Road, Elkhorn Boulevard and Project Street 1, Elkhorn Boulevard and Project Street 2, and Elkhorn Boulevard and Project Street 3. Therefore, the project's cumulative impacts on these intersections are considered ***significant and unavoidable***.

- ***Cumulative Impacts on Study Area Roadway Segments.*** The proposed project in combination with cumulative projects would increase traffic volumes along the Elkhorn Boulevard west of SR 70/99 interchange segment and would cause this segment to degrade from an acceptable operating condition (i.e., LOS A) to an unacceptable operating condition (i.e., LOS F). No feasible mitigation is available to reduce the project's cumulative impacts on this segment. Therefore, the project's cumulative impact on this roadway segment would be ***significant and unavoidable***.
- ***Cumulative Impacts on Study Area Freeway Ramps.*** The proposed project in combination with cumulative projects would increase traffic volumes on the freeway system and would cause six study freeway ramps to operate unacceptably under Cumulative plus Project conditions and exceed Caltrans thresholds of significance for freeway ramp operations. With implementation of recommended mitigation measures, SR 70/99 Northbound to Elkhorn Boulevard off-ramp, I-5 Northbound to Metro Air Parkway off-ramp, I-5 Southbound to Metro Air Parkway off-ramp, and the Metro Air Parkway to I-5 Southbound loop on-ramp would operate at acceptable levels under cumulative conditions and the project's cumulative impact would be reduced to a less-than-significant level. However, these ramps are not under

the jurisdiction of the City of Sacramento (i.e., subject to Caltrans jurisdiction). While the project would contribute funds that would implement measures that would fully mitigate impacts on these ramps to a less-than-significant level, it is unknown whether these measures would be implemented because they are not subject to the control of the City. As a result, for purposes of CEQA, cumulative impacts on these ramps would be **significant and unavoidable**.

Further, no feasible mitigation is available or implementation of feasible mitigation can not be guaranteed because it is not subject to the control of the City for the Elkhorn Boulevard to SR 70/99, Southbound slip on-ramp, and the Northbound to SR 70/99 Northbound off-ramp. Therefore, the project's cumulative impacts on these ramps are considered **significant and unavoidable**.

- **Cumulative Freeway Mainline Segment Impacts.** The proposed project in combination with cumulative projects would increase traffic volumes on the freeway system and would cause three study freeway mainline segments (i.e., I-5 east of Powerline Road, I-5 north of Del Paso Road, I-5 north of I-5/I-80 interchanges between I-80 and Arena Boulevard) to operate unacceptably under Cumulative plus Project conditions. These intersections would operate unacceptably under Cumulative No Project conditions; however, the project would contribute additional trips to these intersections, which is unacceptable based on Caltrans standards. No feasible mitigation is available to reduce the project's cumulative mainline freeway segment impacts (Impacts 6.1-8a, b, and c) to a less-than-significant level. Therefore, the project's cumulative impacts on these mainline freeway segments would be **significant and unavoidable**.

► *Short-term Construction-Generated Emissions*

The proposed project would result in construction-generated emissions that would exceed SMAQMD's significance threshold for NO_x and would contribute concentrations that would exceed ambient air quality standards. Mitigation recommended for the project would include measures to limit temporary construction emissions including use of late-model engines, low-emission diesel products, alternative fuels, payment of fees to SMAQMD's construction mitigation fund, and reduction of fugitive dust emissions. Implementation of the recommended mitigation would substantially reduce NO_x and fugitive dust emissions; however, emissions would still exceed SMAQMD's significance thresholds. Therefore, the project would result in a **significant unavoidable** impact and would result in a substantial contribution to a **significant and unavoidable** cumulative impact.

► *Generation of Long-Term (Regional) Emissions of ROG, NO_x, and PM₁₀*

Long-term operation of the project would result in operations of ozone-precursor pollutants that would exceed SMAQMD's threshold. Furthermore, the project's operational emissions would conflict with or obstruct implementation of applicable air quality plans. Mitigation recommended for the project would include the redesign and incorporation of features into the project that would encourage bicycle, pedestrian, and transit use, would eliminate physical barriers between residential and nonresidential uses, and build to Title 24 energy standards. Implementation of the recommended mitigation would substantially reduce operational emissions; however, emissions would still exceed SMAQMD's significance thresholds. Therefore, the project would result in a **significant unavoidable** regional emission impact and would result in a substantial contribution to a **significant and unavoidable** regional emission cumulative impact.

► *Exposure of Sensitive Receptors to Toxic Air Contaminant Emissions*

~~Implementation of the above mitigation measure would reduce health-related risks associated with on-site mobile-source TACs, but not necessarily to a less-than-significant level.~~ Exposure to mobile-source TAC emissions from on-site mobile sources are, therefore, considered **significant and unavoidable**. This conclusion is because of the uncertainty associated with on-site commercial land use activities and the proximity of sensitive receptors to such uses. This conclusion may, therefore, change as more detailed information regarding proposed on-site commercial uses becomes available.

► *Long-Term Operational Traffic Noise*

Implementation of the project would result in increases in traffic noise levels greater than 4 dBA and would cause noise levels to exceed the County's 60 dBA day-night average noise level (L_{dn})/CNEL exterior noise standards at sensitive receptors in unincorporated Sacramento County. No feasible mitigation is available to reduce exterior project-related traffic noise levels to a less-than-significant level. Therefore, the project would result in a **significant and unavoidable** long-term operational traffic noise impact and would result in a substantial contribution to a **significant and unavoidable** long-term operational traffic noise cumulative impact in the County.

► *Land Use Compatibility with On-site Noise Levels*

Implementation of the project would expose on-site sensitive receptors to future noise levels generated by area traffic and light rail operations that exceed applicable noise standards. Mitigation recommended for the project would require the construction of sound barriers, reorientation of on-site land uses to protect outside areas from transportation noise, and preparation of site-specific acoustical analyses. Even with implementation of recommended mitigation, outdoor areas at proposed residential uses and the proposed school would exceed the City's noise standards. Therefore, the project would result in a **significant and unavoidable** land use compatibility impact and would result in a substantial contribution to a **significant and unavoidable** land use compatibility cumulative impact.

► *Environmental Impacts Associated with SRWTP Expansion*

The project would result in increased demand for wastewater treatment from the SRWTP. Although wastewater treatment capacity is currently available to serve the project, the project in combination with other cumulative development would result in the need to expand the capacity of the SRWTP. SRCSD prepared and approved the SRWTP 2020 Master Plan Expansion Project in 2004, which would allow the incremental expansion of the SRTWP to meet projected wastewater demands over the next 15–20 years. An EIR was prepared and certified for that project and identified one significant and unavoidable impact related to construction-related air quality. Although wastewater treatment capacity is currently available to serve the project, the project in combination with other development would contribute to the need for and expanded SRWTP and would contribute to the **significant and unavoidable** construction-related air quality impact. Therefore, the project would contribute to a **significant and unavoidable** cumulative wastewater impact.

► *Increased Demand for Fire and Emergency Medical Services*

Implementation of the project would increase demand for fire protection services. Although the Sacramento Fire Department is planning to construct a new fire station near the project site and with this facility SFD would provide fire and emergency services to the project site within acceptable standards, the timing of construction of this facility is currently unknown and could result in a potentially significant fire and emergency medical service impact. Mitigation recommended for the project would require that adequate fire and emergency medical services be in place before issuance of the project's first occupancy permit, which may require the construction of a new fire station facility. Construction of this facility could result in construction-related environmental effects some of which may be significant and unavoidable even with implementation of all feasible mitigation. Therefore, because the project would contribute the need for a new fire station facility the construction of which could result in significant and unavoidable environmental effects, this would be a **significant and unavoidable** impact.

► *Degradation of Visual Character*

Implementation of the proposed project would substantially alter the visual character of the project site through conversion of agricultural land to developed urban uses, resulting in a significant aesthetic impact related to degradation of visual character. Because of the scale and location of the proposed project, there is

no feasible mitigation available to address aesthetic resource impacts associated with the conversion of agricultural land to urban development. Although design, architectural, development, and landscaping standards are included to ensure that urban development on the project site remains within certain aesthetic guidelines, there is no mechanism to allow implementation of the project while avoiding the conversion of the local viewshed from agricultural to urban development. Therefore, this impact would remain **significant and unavoidable** and would contribute to a **significant and unavoidable** cumulative impact.

► *Conversion of Open Space*

The proposed project would result in the conversion open space areas to urban land use. Because feasible mitigation is not available to completely mitigate the loss of open space, this impact would be **significant and unavoidable** and the project would contribute to a **significant and unavoidable** cumulative open space impact.

► *Potential for Safety Hazards from Proximity of Airport to Proposed Land Uses*

The project would result in the construction of seven neighborhood parks and a light rail station either partially or wholly within the safety zone as identified in the Sacramento International Airport CLUP. These land uses are prohibited from being located within the safety zone in order to minimize potential risks associated with aircraft hazards. Therefore, the project would result in a significant impact related to incompatibility with the Sacramento International Airport CLUP. Mitigation recommended for the project would require the City to issue an override to the Airport Land Use Commission's (ALUC's) consistency determination. However, this mitigation would not eliminate the project's inconsistency with the CLUP; therefore, this would be a **significant and unavoidable** impact.

► *Conversion of Prime Farmland and Unique Farmland*

The proposed project would result in the conversion Prime and Unique Farmland to urban land use. Because feasible mitigation is not available to completely mitigate the loss of Prime Farmland and Unique Farmland, this impact would be significant and unavoidable and the project would contribute to a **significant and unavoidable** cumulative farmland impact.

► *On-Site Flooding Risk from Potential for Levee Failure*

The project site would be threatened by potential levee failure associated with a 100-year flood event for an interim time period, until levee improvements are implemented. Once the levee improvements are made, it would be expected that the levees would provide at least 100-year flood protection. Because the unknown timeframe for levee improvements could expose on-site residents to flooding from the 100-year event, and because the project would contribute to potential environmental impacts associated with construction of levee improvements, impacts related to on-site flooding risks from potential levee failure are considered an interim **significant and unavoidable** project and cumulative impact. Once improvements to the levee are made, impacts associated with exposure to the 100-year flood event would be **less than significant** (project and cumulative).

► *Construction-Related Impacts from Levee Improvements*

The project would contribute to the need to construct levee improvements the construction of which could result in significant environmental effects for which mitigation may not be available to reduce the impact to a less-than-significant level. This would be a **significant and unavoidable** project and cumulative construction-related impact.

8 COMPARATIVE MERITS OF THE ALTERNATIVES

In accordance with Section 15126.6(a) of the California Environmental Quality Act Guidelines (State CEQA Guidelines), an environmental impact report (EIR) must discuss a range of reasonable alternatives to the project "...which would feasibly attain most of the basic objectives of the project...and evaluate the comparative merits of the alternatives." The factors that can determine feasibility are site suitability, other plan or regulatory limitations, and jurisdictional boundaries. An EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote and speculative. The alternatives analysis must also include a comparative evaluation of the No Project Alternative (State CEQA Guidelines Section 15126.6[e]). Through comparison of the alternatives, the advantages and disadvantages of each alternative compared with the proposed project can be weighed. Chapter 4 provides a description of the alternatives that are analyzed in this EIR.

This chapter provides a comparative summary of potentially feasible alternatives considered in this EIR. Alternatives that were considered but rejected as infeasible and alternatives that were considered and resulted in changes to the project are discussed in Chapter 4, "Alternatives to the Proposed Project." Section 8.1 provides a comparative analysis of a Reduced Size Alternative, Section 8.2 provides a comparative analysis of a Dispersed Development Alternative, and Section 8.3 provides a comparative analysis of a No Project Alternative. Section 8.4 summarizes the environmental conclusions of the alternatives analysis and compares the project impacts for each resource area to impacts associated with the alternatives. Lastly, Section 8.5 identifies the environmentally superior alternative.

8.1 CONSIDERATION OF AN OFF-SITE ALTERNATIVE

The key question in consideration of an off-site alternative is whether a feasible alternative is available that would feasibly attain most of the basic objectives of the project, and would also avoid or substantially lessen any of the significant environmental effects of the project (State CEQA Guidelines Section 15126.6[a]). The basic objectives of the project include creating a residential development located near downtown Sacramento and Metro Air Park, as well as providing development and a light rail stop along the proposed Downtown-Natomas-Airport light rail line with densities that would support the feasibility of a light rail line. In addition, the project site is located immediately adjacent to (across State Route [SR] 70/99 from) the North Natomas community and the project would be located within the North Natomas Community Plan (NNCP) area through a boundary amendment. The project would be a special planning area and would implement its own planned unit development guidelines. Because the NNCP area provides the greatest area of available land for development within close proximity to downtown Sacramento, the Sacramento International Airport, and alternative transportation opportunities, the North Natomas community is considered the most reasonable and feasible location for a potential off-site alternative. Further, staff of the Sacramento Regional Transit District have expressed (during a Sacramento Local Area Formation Commission [LAFCo] hearing) that the location of the project and its proposed land uses and densities "create an environment that is transit supportive" and would be critical to ensuring the success of the Downtown-Natomas-Airport transit line (Scott 2005).

According to the City of Sacramento's (City's) General Plan, as of September 2005 there were approximately 14,000 acres of low- and medium-density parcels of vacant land available. However, this number is likely less than this total, because there continues to be urban development in the North Natomas area, where the majority of this land is concentrated. For example, projects considered in a cumulative context include the Westborough, Cambay West, Natomas Crossing, Natomas Town Center, Natomas Creek and Panhandle projects (Exhibit 6-1), each of which is in the North Natomas area. As this shows, the North Natomas area continues to be actively developed, and much of the land is tied up by other landowners interested in development. None of the undeveloped low- or medium-density residential or residential/mixed-use properties within the NNCP area are currently owned by the Greenbriar property owner. As described in Chapter 4, "Alternatives to the Proposed Project," this alternative has been rejected as infeasible because land suitable for development of the project is not

available. Nonetheless, a comparative analysis is provided below to describe the comparative environmental effects if this alternative were feasible. For this reason, an off-site alternative that would be located within the North Natomas area is considered below, but a specific off-site property has not been selected as the “off-site alternative project site.” However, to consider the relative environmental impacts of an alternative in one of the undeveloped areas of the NNCP currently designated for low- or medium-density residential development, this section provides a comparative analysis of a theoretical off-site alternative within the vacant low- or medium-density residential properties within the NNCP.

A key version of this alternative is that, if development of the project were to occur within the boundaries of the NNCP, it would displace development that would otherwise occur within the boundaries of the NNCP. It is assumed, therefore, that the overall development of the NNCP would be the same, that is, development of the project would replace a similar level of development already planned within the NNCP. The Greenbriar site would not be developed. Therefore, overall development (considering the NNCP and Greenbriar) would be less under this alternative than under the proposed project if this alternative were feasible.

8.1.1 TRANSPORTATION AND CIRCULATION

Development of an off-site alternative would result in the same trip generation rates as the project (i.e., 41,119 total trips; 3,153 in the a.m. peak hour and 4,467 in the p.m. peak hour). The transportation and circulation impacts of an alternative within the existing NNCP boundaries have been projected by the 1993 NNCP EIR (City of Sacramento 1993). The SACMET 2025 traffic analysis model, developed for the North Natomas area, includes the assumptions consistent with the 1993 NNCP EIR and the ultimate land uses projected for the North Natomas area. This model reflects the NNCP and approved land use changes in the North Natomas area, as well as the ultimate roadway configuration planned for the NNCP area, as specified in the NNCP Financing Plan. If the project were to occur within the boundaries of the NNCP, consistent with the NNCP, the additional vehicle trips projected by this EIR would not be additive to overall development assumptions of the NNCP, because they have already been included in these projections. Thus, it can be assumed that an off-site alternative within the boundaries of the NNCP would result in comparatively substantially less traffic impacts; however, specific quantification of the traffic reductions can not be determined without a specific location for the off-site alternative. The same transportation system deficiencies would be expected with the Greenbriar project, although the overall congestion and anticipated delays would be less. Thus, this alternative would result in less transportation and circulation impacts [*Less*].

8.1.2 AIR QUALITY

The air quality impacts identified for the proposed project are related to construction, the land uses proposed (e.g., residential, elementary school, and commercial tenants), and the location of these land uses adjacent to Interstate 5 (I-5) and SR 70/99. Construction of an off-site alternative would result in the same construction and long-term operational emissions as the project (i.e., mitigated to 89.5 pounds per day [lb/day] of reactive organic gases [ROG] and 511.2 lb/day of oxides of nitrogen [NO_x]) because the same land uses would be developed. Similarly, operational emissions associated with the off-site alternative would be the same as the proposed project because the same land uses are proposed. As a result, the off-site alternative would result in mitigated emissions of 350.7 lb/day of ROG, 338.5 lb/day of NO_x, and 206.6 lb/day of respirable particulate matter (PM₁₀). However, because overall there would be less development under this alternative than if the Greenbriar site were to develop (see assumptions under description of the alternative), regional emissions would be substantially less than with the project. Further, depending on the location (or multiple locations) of the off-site alternative, the off-site alternative may not be located in close proximity (i.e., within 500 feet) of a nearby freeway (e.g., I-5 or SR 70/99) and may reduce potential less-than-significant health risk-related air quality impacts associated with toxic air contaminants. However, because the specific location for the off-site alternative is not known, it can not be determined with any certainty whether this project would reduce this potential. Therefore, overall the project would result in similar air quality impact [*Similar or less*].

8.1.3 NOISE

Similar to the project, this alternative would result in temporary noise generated by construction activities; development of various noise-generating land uses; increases in traffic noise; and development of sensitive receptors that would be exposed to existing or project noise levels exceeding City standards. Because the off-site alternative would result in the construction of the same facilities and use of similar construction equipment, unmitigated construction-related noise levels would range from 79 to 91 A-weighted decibels (dBA) at 50 feet. However, similar to the project, construction activities would be limited to the hours of 7 a.m. to 6 p.m. Monday through Saturday and 9 a.m. to 6 p.m. on Sunday, which would reduce construction-related noise impacts to a less-than-significant level. Because of the developing nature of the NNCP area, it is likely that the off-site alternative would be in close proximity to sensitive receptors. It is unknown whether existing noise levels currently exceed the City's standards; however, construction of an off-site alternative would likely result in an increase in ambient noise levels in the local area and could result in an exceedance of the City's exterior noise standard (i.e., 60 dBA day-night average noise level [L_{dn}]/community noise equivalent level [CNEL]). If an alternative were developed within an available site within the NNCP, noise levels associated with roadway traffic volumes would likely be comparatively less (i.e., less than 74–81.1 dBA unmitigated) because this site would be located at a greater distance from the combined impacts of traffic noise from I-5 and SR 70/99. Thus, significant noise impacts on residential and school uses may be eliminated depending on the location of the off-site alternative. However, final determination of traffic noise reductions cannot be made without knowing the specific location of the off-site alternative. Similarly, although noise impacts at the site from aircraft operations at the Sacramento International Airport are less than significant, the off-site alternative would likely be located a greater distance from regularly used flight paths and would therefore be subject to less frequent overflights by aircraft and would likely have reduced single-event (SENL) levels. Because of its likely more distant location from I-5 and SR 70/99 and airport operations, the off-site alternative would result in less noise impacts than the project [*Less*].

8.1.4 UTILITIES

An off-site alternative within the NNCP boundaries would generate a similar number of people and create similar utility and service system demands as the proposed project (i.e., water, wastewater, drainage, electricity, and natural gas). These NNCP demands have already been anticipated by the North Natomas Financing Plan (first approved in 1994, and last updated in 2002) and the public facilities fees (PFFs) that are collected for projects within the current North Natomas boundaries. The project's demands would be addressed by the financing plan prepared specifically for the project. The significant environmental impacts that would occur with the provision of wastewater treatment services (i.e., expanded wastewater treatment facilities) to the project would not be expected to occur under this alternative because the NNCP area is within the City's corporate boundaries and was planned for in the Sacramento Regional County Sanitation District's (SRCSD's) facility master plan. Therefore, this alternative would eliminate the project's significant and unavoidable impact on wastewater treatment services. Although the proposed project and an off-site alternative within the boundaries of the NNCP would have similar utility system demands, the off-site alternative would eliminate the project's significant and unavoidable impact on wastewater treatment services and impacts would be less [*Less*].

8.1.5 PUBLIC SERVICES

An off-site alternative within the NNCP boundaries would generate a similar number of people and create similar public service demands (i.e., police, fire, schools, and libraries) as the proposed project. These NNCP demands have already been anticipated by the North Natomas Financing Plan (first approved in 1994, and last updated in 2002) and the PFFs that are collected for projects within the current North Natomas boundaries. The project's demands would be addressed by the financing plan prepared specifically for the project. Further, a site within the NNCP would not result in demands that are additive to overall development demands of the NNCP because they have already been included in these projections. For these reasons, an off-site alternative, while resulting in the same demands as the project based on a per-capita demand factor for each service, would have comparatively less

public services effects because demands associated with buildout of the NNCP area have already been planned for by the City in the NNCP. Overall, this alternative would result in less public services impacts [*Less*].

8.1.6 PARKS AND OPEN SPACE

An off-site alternative within the NNCP boundaries would generate a similar number of residents as the proposed project and would construct the same facilities (i.e., 48.4 net acres of parkland) as the project. The City’s standard for parkland dedication (5 acres per 1,000 new residents or a demand for 48.2 acres) would remain the same regardless of the location of the off-site alternative. However, a site within the NNCP would not result in demands that are additive to overall park demands of the NNCP because they have already been included in these projections. The project would result in the conversion of 577 acres of open space area (518 acres of which are farmlands). While an off-site alternative would likely also result in the conversion of open space areas, the loss of this open space areas were accounted for in the NNCP and its EIR; therefore, this alternative would not result in the additive loss of open space resources. The off-site alternative would have less effects related to parks and open space [*Less*].

8.1.7 AESTHETICS

Under this alternative, it is likely that development of property within the NNCP boundaries would result in the development of open space land or land historically used for farming activities. Therefore, the off-site alternative would result in the same type of land use alterations as the project because the site would be converted to urban land uses. This was identified as a significant and unavoidable impact for the project. However, the project would extend the area of the City that would be converted from agricultural to urban land uses. A development within the NNCP would maintain the City’s boundaries and would not extend the urban core of the City. Lighting would be similarly changed under this alternative, but lighting impacts were not identified as significant project impacts. Overall, this alternative would result in the same aesthetic resources impacts, but these impacts would be less than impacts under the project because the existing urban core of the City would be maintained [*Less*].

8.1.8 PUBLIC HEALTH AND HAZARDS

While it is unknown whether an off-site location would have contaminated soils, development within the boundaries of the NNCP would not be expected to result in public health and hazards impacts that could not be addressed by standard mitigation and remediation measures (City of Sacramento 1992). It should be noted that a project site within the boundaries of the NNCP would locate the proposed lake/detention basin at a greater distance from the Sacramento International Airport, which would reduce potential bird hazard impacts in comparison to the project. The Sacramento International Airport discourages the construction of water features that could attract hazardous wildlife within 5 miles of the airport. Although the off-site alternative would construct the same water feature at a greater distance from the airport, it nonetheless would likely be located within the airport’s 5-mile radius and would be considered a hazardous wildlife attractant. However, implementation of the project’s mitigation to reduce bird hazards from the lake would reduce this impact to a less-than-significant level.

An off-site alternative would eliminate the project’s potential inconsistency with the Sacramento International Airport Comprehensive Land Use Plan’s (CLUP’s) requirement to limit land uses (i.e., parks and light rail station) that would result in a substantial concentration of people (i.e., 25 persons per acre on average of 50 persons per acre at any one time) because the off-site alternative would be located outside the airport’s overflight safety zone. Therefore, the off-site alternative would eliminate the project’s significant and unavoidable CLUP consistency impact. Further, a site within the NNCP would locate sensitive receptors, including the elementary school, at greater distances from I-5 and SR 70/99, which would reduce their exposure to mobile-source emissions (see Section 8.1.2, “Air Quality,” above). Thus, an off-site alternative within the boundaries of the NNCP would have less public health and hazard effects [*Less*].

8.1.9 GEOLOGY AND SOILS

The City determined that the NNCP includes measures to reduce soils and geology impacts to a less-than-significant level (City of Sacramento 1992). No unique geologic structures or conditions have been identified in the NNCP area, and the NNCP area is substantially similar to the project site in terms of site soils and geotechnical issues (i.e., liquefaction, expansive soils, fault hazards). Similar to the proposed project, standard engineering practices can address design and structural requirements for development of a site within the NNCP boundaries. For these reasons, there would be no measurable difference in environmental impacts when comparing the proposed project with an off-site alternative within the boundaries of the NNCP [*Similar*].

8.1.10 HYDROLOGY, DRAINAGE, AND WATER QUALITY

Hydrology and drainage in the NNCP area has been addressed by the Comprehensive Drainage Plan. Similar to the requirements for the proposed project, any development within the NNCP would be required to comply with the City's Grading, Erosion, and Sediment Control Ordinance (Chapter 15.88 of the City Code). A storm water pollution prevention plan (SWPPP) would be prepared and implementation of best management practices (BMPs) would be required to address stormwater quality control during construction and postconstruction. With the implementation of these existing requirements, less-than-significant impacts on water quality and hydrology would occur. Further, the alternative would be required to be designed consistent with the City's drainage system standards to ensure that adequate drainage facilities are provided on-site and that adequate capacity is available in off-site drainage facilities to handle proposed flows. Drainage impacts were determined to be ~~less than~~ significant with the project until levee improvements are constructed. Similar to the project, this alternative would be located in an area identified as being at risk of levee failure and that could be subject to flooding risks, that is located outside the Federal Emergency Management Agency's (FEMA) 100-year floodplain and less than significant flooding impacts would occur. This alternative would also contribute to the need for construction of levee improvements. Therefore, the proposed project and an off-site alternative within the current boundaries of the NNCP would have similar hydrology, drainage, and water quality effects [*Similar*].

8.1.11 AGRICULTURE

Approval of the NNCP required that the City adopt a Statement of Overriding Considerations for the significant impact of conversion of Prime Farmland. The City has determined that conversion of farmlands that were once within the boundaries of the NNCP was an acceptable impact and that there were overriding reasons for approval of development of the NNCP. The project would require a similar finding because of the presence of Important Farmland at the project site. However, approval of the project would result in the conversion of an additional 518 acres of Important Farmland beyond the conversions anticipated by the NNCP. Thus, development of an off-site alternative within the boundaries of the NNCP would result in conversion of fewer acres (i.e., 518 fewer acres) of Important Farmland to urban uses. For these reasons, an off-site alternative within the boundaries of the existing NNCP would create less impact on Important Farmland [*Less*].

8.1.12 BIOLOGICAL RESOURCES

Similar to the proposed project, development of the North Natomas community would result in impacts on Swainson's hawk, riparian/wetland habitat, and agricultural lands/rice fields. Without knowing the exact site within the NNCP boundaries that could be pursued for an off-site alternative, it is not possible to perform a detailed comparison of biological impacts. However, development of an off-site alternative within the NNCP would bring the project within the City's permit area identified in the Natomas Basin Habitat Conservation Plan. The NBHCP, the EIR on the NBHCP, and subsequent monitoring programs have evaluated the impacts on biological resources from development within the NNCP area, including impacts on giant garter snake and Swainson's hawk. The project is not included in the City's permit area. The biological impacts of the project are subject to ongoing review, including review by resource agencies of the applicant's specific mitigation proposal.

Based on these conditions, development of an off-site alternative within the NNCP area would have less biological resource impacts than the project. However, because the project would be required to comply with its own HCP, it would require a finding from USFWS and DFG that impacts on sensitive biological resources are fully mitigated, and it is expected that impacts would not be significant. Nevertheless, because less land would be developed under this alternative, it would have less of an effect on sensitive biological resources [*Less*].

8.1.13 CULTURAL RESOURCES

Both the off-site location and the project site would have the potential for presence of undocumented subsurface cultural resources. However, there are no documented resources on either the project site or on low-density residential sites within the NNCP. For this reason, the proposed project and an alternative within the current boundaries of the NNCP would have similar effects on cultural resources [*Similar*].

8.1.14 PROJECT OBJECTIVES

Depending on the specific location, the off-site alternative could meet most if not all of the project's objectives, including those related to creation of a pedestrian-friendly development; development of a project that is consistent with the Sacramento Area Council of Governments' (SACOG's) Blueprint plan, development of a residential development near the major employment centers of downtown Sacramento and Metro Air Park; provision of vertically and horizontally mixed neighborhoods; incorporation of parks and open space in a manner that provides connectivity; creating a residential development with a variety of housing types; and providing housing and employment opportunities that meet the City's long-term housing and employment demand projections. In addition, an off-site alternative could possibly further support and implement the project objective related to developing a project that is consistent with the Sacramento International Airport CLUP because it would eliminate the project's inconsistency with the safety requirement of maintaining a density of 50 persons per acres for the proposed light rail station, and park areas. However, the off-site alternative may not meet the project's objective of providing readily accessible light rail transit opportunities on-site.

8.2 CONSIDERATION OF DISPERSED DEVELOPMENT ALTERNATIVE

Among the findings to be considered in deliberations over the project, LAFCo will need to determine whether expansion of the City's Sphere of Influence (SOI) will be needed to provide adequate housing within its jurisdiction to meet projected housing demands. There are several properties designated for residential land uses within the City that are either undeveloped or underutilized such that they could be developed (or redeveloped) with new residential land uses that could help the City meet its long-term housing demands. The City's objective in considering the Greenbriar project is to consider development projects that would provide housing and employment opportunities that would meet long-term employment and housing demand projections.

According to the City's General Plan, as of September 2005 there were approximately 14,000 acres of low- and medium-density parcels of vacant land available. However, this number is likely less than this total, because there continues to be urban development in the North Natomas area, where the majority of this land is concentrated. For example, projects considered in a cumulative context include the Westborough, Cambay West, Natomas Crossing, Natomas Town Center, Natomas Creek and Panhandle projects (Exhibit 6-1), each of which are in the North Natomas area. In the south Sacramento area, SunCal Companies has announced that they intend to develop on of the last remaining large blocks of land in the City, the 800-acre Delta Shores site (SunCal press announcement, November 8, 2005). Vacant industrial sites at the downtown Sacramento and Curtis Park railyards are being actively pursued for development, with applications submitted on both. As this shows, the North Natomas area continues to be actively developed, and other large, vacant, or undeveloped parcels are be actively pursued. Further, much of the land is tied up by other landowners interested in development. None of the undeveloped low- or medium-density residential or residential/mixed-use properties within the NNCP area or in other large, undeveloped areas of the City are currently owned by the Greenbriar property owner.

The purpose of this alternative is to consider whether existing properties within the City's SOI could support the project's proposed land uses, while at the same eliminating some of the project's significant and significant and unavoidable environmental impacts. As described above, sufficient holding capacity is available within the City's SOI to accommodate the project's proposed residential development. In spite of the fact that the City may currently have holding capacity for the project, this is not expected to be the case in the foreseeable future. According to Sacramento City staff (McDonald, pers. comm., June 19, 2006), the Technical Background Report for the City of Sacramento General Plan Update shows the following:

Current (2005) Population:	450,000
Proposed General Plan Holding Capacity (2030):	564,000
Anticipated City Population (2030):	650,000

Over the next 25 years, the City is expected to grow by 200,000 people. However, the current General Plan, including the current SOI, would accommodate an additional estimated 114,000 people. Additional land would be needed if the City intends to accommodate the 86,000 people above the General Plan's holding capacity that are anticipated to live in the City.

The proposed project would also provide for employment through commercial/retail uses, although these uses would primarily serve residential uses on and near the project site. Projections for employment uses in the City are as follows:

Current (2005) Employment:	181,000
Proposed General Plan Holding Capacity (2030):	445,000
Anticipated City Employment (2030):	321,000

Unlike housing, the City has ample holding capacity for employment uses. As mentioned above, commercial/retail uses on the project site are intended to be locally serving, and they would reduce the need for driving trips outside the project site. So, while they could be provided elsewhere within the City, they would frustrate project objectives for a mixed-use development.

8.2.1 TRANSPORTATION AND CIRCULATION

Implementation of a dispersed development alternative would result in similar trip generation rates as the project (i.e., 41,119 total trips; 3,153 in the a.m. peak hour and 4,467 in the p.m. peak hour); however, these trips would not be concentrated in one area of the City, but instead would be dispersed throughout multiple properties and areas of the City. Overall, this alternative could result in reduced transportation impacts because proposed trips would be dispersed over a large area; however, quantification of the traffic reductions cannot be determined without specific locations for the dispersed development alternative. In some cases, the existing roadway network may currently operate unacceptably and, thus, this alternative would exacerbate these unacceptable conditions. Thus, this alternative would result in similar (but may be greater or lesser) transportation and circulation impacts [*Greater or Less*].

8.2.2 AIR QUALITY

The air quality impacts identified for the proposed project are related to construction, the land uses proposed (e.g., residential, elementary school, and commercial tenants), and the location of these land uses adjacent to I-5 and SR 70/99. Construction of an off-site alternative would result in the same construction and long-term operational emissions as the project (i.e., mitigated to 89.5 lb/day of ROG and 511.2 lb/day of NO_x) because the same land uses would be developed. Similarly, operational emissions associated with the dispersed development alternative would be the same as the proposed project because the same land uses are proposed. As a result, the dispersed development alternative would result in mitigated emissions of 350.7 lb/day of ROG, 338.5 lb/day of NO_x, and 206.6 lb/day of PM₁₀. Depending on the multiple locations of the dispersed development alternative, this

alternative may not be located in close proximity (i.e., within 500 feet) of a nearby freeway (e.g., I-5 or SR 70/99) and may reduce potential less-than-significant health risk–related air quality impacts associated with toxic air contaminants (TACs). However, because the specific locations for this alternative are not known, it cannot be determined with any certainty whether this project would reduce this potential TAC impact. Therefore, overall this alternative would result in similar air quality impacts as the project [*Similar or less*].

8.2.3 NOISE

Similar to the project, this alternative would result in temporary noise generated by construction activities; development of various noise-generating land uses; increases in traffic noise; and development of sensitive receptors that would be exposed to existing or project noise levels exceeding City standards. Because the dispersed development alternative would result in the construction of the same facilities and use of similar construction equipment, unmitigated construction-related noise levels would range from 79 to 91 dBA at 50 feet. However, similar to the project, construction activities would be limited to the hours of 7 a.m. to 6 p.m. Monday through Saturday and 9 a.m. to 6 p.m. on Sunday, which would reduce construction-related noise impacts to a less-than-significant level. Because of the developed nature of the City, it is likely that this alternative would be in close proximity to sensitive receptors. It is unknown whether existing noise levels currently exceed the City’s standards; however, construction of a dispersed development alternative would likely result in an increase in ambient noise levels in the local area and could result in an exceedance of the City’s exterior noise standard (i.e., 60 dBA $L_{dn}/CNEL$). If an alternative were dispersed throughout the City, noise levels associated with roadway traffic volumes would likely be comparatively less (i.e., less than 74–81.1 dBA unmitigated) because this site would be located at a greater distance from the combined impacts of traffic noise from I-5 and SR 70/99. Thus, significant noise impacts on residential uses may be eliminated depending on the location of this alternative. However, final determination of traffic noise reductions cannot be made without knowing the specific locations for this alternative. Similarly, although noise impacts at the site from aircraft operations at the Sacramento International Airport are less than significant, this alternative would likely be located a greater distance from regularly used flight paths and would therefore be subject to less frequent overflights by aircraft and would likely have reduced single-event (SENL) levels. Because of its likely more distant location from I-5 and SR 70/99 and airport operations, the dispersed development alternative would result in less noise impacts than the project [*Less*].

8.2.4 UTILITIES

An off-site alternative dispersed throughout the city limits and SOI would generate a similar number of people and create similar utility and service system demands as the proposed project (i.e., water, wastewater, drainage, electricity, and natural gas). These demands have already been anticipated by various public facilities financing programs established by the City. The significant environmental impacts that would occur with the provision of wastewater treatment services (i.e., expanded wastewater treatment facilities) to the project would not be expected to occur under this alternative because dispersed locations would be within the city limits or SOI and have been planned for in the SRCSD’s facility master plan. Therefore, this alternative would eliminate the project’s significant and unavoidable impact on wastewater treatment services. Although the proposed project and a dispersed development alternative would have similar utility system demands, the dispersed development alternative would eliminate the project’s significant and unavoidable impact to wastewater treatment services and impacts would be less [*Less*].

8.2.5 PUBLIC SERVICES

A dispersed development alternative within the city limits or SOI would generate a similar number of people and create similar public service demands (i.e., police, fire, schools, and libraries) as the proposed project. These demands have already been anticipated by the City’s General Plan and the public facilities fees that are collected for projects within specific service areas. These fees would provide sufficient facilities and capacity to serve this alternative. For these reasons, a dispersed development alternative, while resulting in the same demands as the

project based on a per-capita demand factor for each service, would have comparatively less public services effects because demands associated with buildout of the city limits or SOI have already been planned for by the City. Overall, this alternative would result in less public services impacts [*Less*].

8.2.6 PARKS AND OPEN SPACE

A dispersed development alternative within the city limits or SOI would generate a similar number of residents as the proposed project and would construct the same facilities (i.e., 48.4 net acres of parkland) as the project. The City's standard for parkland dedication (5 acres per 1,000 new residents or a demand for 48.2 acres) would remain the same regardless of the location of the alternative. While this alternative would also result in the conversion of open space resources, the loss of these were accounted for in the General Plan and its EIR; therefore, this alternative would not result in the additive loss of open space resources. This alternative would have less effects related to parks and open space [*Less*].

8.2.7 AESTHETICS

Under this alternative, it is likely that development of property within the city limits or SOI could result in the development of open space land or land historically used for farming activities. Therefore, this alternative would result in the same type of land use alterations as the project because the site would be converted to urban land uses. However, it is likely that impacts would be less because some parcels where development could occur would be in urban areas (i.e., infill development). Changes to the visual character of the project site were identified as a significant and unavoidable impact for the project. However, the project would extend the area of the City that would be converted from agricultural to urban land uses. A development within the city limits or SOI would maintain the City's boundaries and would not extend the urban core of the City. Lighting would be similarly changed under this alternative, but lighting impacts were not identified as significant project impacts. Overall, this alternative would result in the same aesthetic resources impacts, but these impacts would be less than those of the project because the existing urban core of the City would be maintained [*Less*].

8.2.8 PUBLIC HEALTH AND HAZARDS

While it is unknown whether an off-site location would have contaminated soils, development within the City's SOI would not be expected to result in public health and hazards impacts that could not be addressed by standard mitigation and remediation measures (City of Sacramento 1992). It should be noted that because development would be dispersed over multiple properties, the project's proposed lake/detention basin would likely not be constructed. As a result, this alternative would eliminate the project's potential wildlife hazard impacts. However, implementation of the project's mitigation to reduce bird hazards from the lake would reduce this impact to a less-than-significant level.

A dispersed development alternative would eliminate the project's potential inconsistency with the Sacramento International Airport CLUP's requirement to limit land uses (i.e., parks and light rail station) that would result in a substantial concentration of people (i.e., 25 persons per acre on average of 50 persons per acre at any one time) because this alternative would be located outside the airport's overflight safety zone. Therefore, the dispersed development alternative would eliminate the project's significant and unavoidable CLUP consistency impact. Further, a site within the NNCP would locate sensitive receptors, including the elementary school, at greater distances from I-5 and SR 70/99, which would reduce their exposure to mobile-source emissions (see Section 8.1.2, "Air Quality," above). Thus, a dispersed development alternative within the city limits or SOI would have less public health and hazard effects [*Less*].

8.2.9 GEOLOGY AND SOILS

The City's General Plan and various community plans include measures to reduce soils and geology impacts to a less-than-significant level. No unique geologic structures or conditions have been identified in the greater Sacramento area, and other areas within the City are substantially similar to the project site in terms of site soils and geotechnical issues (i.e., liquefaction, expansive soils, fault hazards). Similar to the proposed project, standard engineering practices can address design and structural requirements for development of a site within the NNCP boundaries. For these reasons, there would be no measurable difference in environmental impacts when comparing the proposed project with a dispersed development alternative within the boundaries of the NNCP [*Similar*].

8.2.10 HYDROLOGY, DRAINAGE, AND WATER QUALITY

Similar to the requirements for the proposed project, any development within the City would be required to comply with the City's Grading, Erosion, and Sediment Control Ordinance (Chapter 15.88 of the City Code). A SWPPP would be prepared and BMPs would be required to be implemented to address stormwater quality control during construction and postconstruction. With the implementation of these existing requirements, less-than-significant impacts on water quality and hydrology would occur. Further, the alternative would be required to be designed consistent with the City's drainage system standards to ensure that adequate drainage facilities are provided on-site and that adequate capacity is available in off-site drainage facilities to handle proposed flows. Drainage impacts were determined to be less than significant with the project. This alternative would be located in areas identified as being at risk of levee failure (e.g., Sacramento River levees) and that could be subject to flooding risks. This alternative could be accommodated in areas located outside the Federal Emergency Management Agency's (FEMA) 100-year floodplain; † This alternative would also contribute to the need for construction of levee improvements; therefore, less than significant flooding impacts would continue to occur. Therefore, a dispersed development alternative within the city limits or SOI would have result in similar hydrology, drainage, and water quality effects as the project, although some of the development could be dispersed to areas of the City that have better flood control protection [*Similar*].

8.2.11 AGRICULTURE

Approval of the project would result in the conversion of 518 acres of Important Farmland and 465 acres of open space areas. While a dispersed development alternative would likely also result in the conversion of Important Farmland, the loss of these were accounted for in the General Plan and its EIR; therefore, this alternative would not result in the additive loss of farmland. For these reasons, a dispersed development alternative within the city limits or SOI would create less impact on Important Farmland [*Less*].

8.2.12 BIOLOGICAL RESOURCES

Similar to the proposed project, development within the city limits and SOI would result in impacts on Swainson's hawk, riparian/wetland habitat, and agricultural lands/rice fields. Without knowing the exact sites within the city limits or SOI that could be pursued for a dispersed development alternative, it is not possible to perform a detailed comparison of biological impacts. Implementation of a dispersed development alternative in the city limits or SOI would be anticipated to result in similar resource impacts as those affected by the project (e.g., foraging habitat, wetlands) and would result in similar take of species because habitat and species present at the project site is common throughout the City and surrounding areas. Developments north of the American River would be located within the City's permit area identified in the Natomas Basin Habitat Conservation Plan. The NBHCP, the EIR on the NBHCP, and subsequent monitoring programs have evaluated the impacts on biological resources from development within the NNCP area, including impacts on giant garter snake and Swainson's hawk. Because this alternative would result in similar habitat and species impacts as the project, it would have similar effects on sensitive biological resources [*Similar*].

8.2.13 CULTURAL RESOURCES

Both the dispersed development site locations and the project site would have the potential for presence of undocumented subsurface cultural resources. However, there are no documented resources on either the project site or on low-density residential sites within the NNCP. For this reason, the proposed project and an alternative within the city limits or SOI would have similar effects on cultural resources [*Similar*].

8.2.14 PROJECT OBJECTIVES

Because of the dispersed nature of this alternative, this alternative would likely not meet many of the project's objectives, including development of a residential development near the major employment centers of downtown Sacramento and Metro Air Park; provision of vertically and horizontally mixed neighborhoods; incorporation of parks and open space in a manner that provides connectivity; creating a residential development with a variety of housing types; and creating a development that could support a light rail station. However, this alternative could possibly further support and implement the project objective related to developing a project that is consistent with the Sacramento International Airport CLUP because it would eliminate the project's inconsistency with the safety requirement of maintaining a density of 50 persons per acres for the proposed light rail station, and park areas. Further, this alternative would be consistent with the City's infill development strategy and would contribute to meeting long-term housing and employment demand projections.

8.3 CONSIDERATION OF A REDUCED SIZE ALTERNATIVE

The key objective of the reduced size alternative is to avoid or reduce several of the significant and unavoidable environmental impacts identified for the project, including minimizing impacts on farmland, noise compatibility, air quality, traffic, sensitive habitat and species, and hazards. As described in Section 4.2.2, "Reduced Size Alternative," the reduced size alternative is designed to reduce the development footprint of the project to avoid one or more of the project's significant and unavoidable impacts. Although this alternative would constrain development at the project site to a development level that may not be financially feasible to implement, it would achieve most if not all of the project's objectives, including providing sufficient development densities to support a light rail station, and it would be consistent with SACOG's Blueprint.

Development under this alternative would be approximately 80% of proposed project levels (20% reduction in proposed development at the site) (Exhibit 4-1). Therefore, this alternative would result in the development of 2,995 residential units and approximately 25 acres of commercial development. The remainder of the site would be undeveloped and would continue in its existing state. To reduce potential impacts on agricultural resources, open space areas, sensitive biological species and habitats, and to minimize the development area that falls within the Sacramento International Airport's safety zone, development of this alternative would need to be concentrated in the eastern portion of the project site. However, mobile-source air emissions and noise impacts from I-5 and SR 70/99 result in the need to locate sensitive receptors, including the elementary school, at a greater distance from these sources. Therefore, this alternative would need to be designed in such a way as to provide a buffer on the eastern and southern boundaries of the site in addition to the proposed buffer on the western boundary of the project site. In general, this alternative would result in a development project that provides a 200- to 400-foot open space buffer along the eastern, southern, and western edges of the project site.

8.3.1 TRANSPORTATION AND CIRCULATION

The reduced size alternative would reduce the number of housing units developed at the project site by approximately 20%, resulting in a corresponding 20% reduction in daily traffic volumes on local roadways. Therefore, the reduced size alternative would result in the generation of 32,896 total trips (2,523 a.m. peak-hour and 3,574 p.m. peak-hour trips). Based on evaluation of the surrounding roadway network, a reduction of approximately 75% of total trip generation (i.e., not to exceed 10,280 total trips) would be required to eliminate

the project's significant and significant and unavoidable transportation-system impacts, including impacts on local roadway intersections, roadway segments, freeway ramps, and freeway segments. Therefore, while this alternative would result in less traffic on area roadways, it nonetheless would continue to result in significant and unavoidable transportation impacts because existing traffic volumes are either closely approaching unacceptable operating conditions or currently exceed acceptable operating thresholds for these facilities. However, it should be noted that mitigation recommended for the project would likely result in more efficient and less congested operation of the local roadway network under the reduced size alternative than under the project. Further, because of its reduced size and the reduced number of traffic trips generated by this alternative, this alternative would result in less transportation and circulation impacts than the project, but these impacts would continue to be significant and unavoidable [Less].

8.3.2 AIR QUALITY

This alternative would result in development of the majority of the project site and the generation of construction- and operations-related air emissions. Air emissions would be approximately 20% less under this alternative because of the reduced number of houses and commercial acreage (and associated vehicle trips). However, because a majority (i.e., 80%) of construction activities and proposed uses would occur, this alternative would also result in the generation of air emissions that exceed relevant standards of the Sacramento Metropolitan Air Quality Management District (SMAQMD) (i.e., construction-related emissions mitigated to 71.6 lb/day of ROG and 408.96 lb/day of NO_x) and operational emissions mitigated to 280.6 lb/day of ROG, 270.8 lb/day of NO_x, and 165.3 lb/day of PM₁₀). This alternative would provide a greater setback between I-5 and SR 70/99 from sensitive receptors through the provision of a 200- to 400-foot buffer along the eastern and southern boundaries of the project site. This setback would further reduce less-than-significant (due to reduced exposure resulting from emissions controls over time; see Section 6.2, "Air Quality") exposure to TACs from freeway operations, and depending on other design considerations (e.g., soundwalls, tree lines), could eliminate any concerns surrounding this issue. Overall, this alternative would result in less construction- and operation-related air emissions than the project, but these impacts would continue to be significant and unavoidable, and this alternative would likely substantially reduce or avoid the project's significant TAC impacts [Less].

8.3.3 NOISE

Both this alternative and the proposed project would result in temporary noise generated by construction activities; development of various noise-generating land uses; increases in traffic noise; and development of sensitive receptors that would be exposed to existing or project-generated noise levels exceeding City standards. Construction-related noise impacts would be the same as under the project (i.e., unmitigated construction-related noise levels ranging from 79 to 91 dBA at 50 feet) because the same types and numbers of construction equipment would be used. However, noise levels at nearby sensitive receptors may be reduced because of the larger buffer areas provided around the development site. Similar to the project, construction activities would be limited to the hours of 7 a.m. to 6 p.m. Monday through Saturday and 9 a.m. to 6 p.m. on Sunday, which would reduce construction-related noise impacts to a less-than-significant level. Given the relative level of traffic (80% of project), compared with the project, traffic noise would be reduced. This alternative would also shift the project footprint of the site to the center and would provide a greater distance between the development and the major noise source of the Sacramento International Airport. More importantly, this alternative would provide a greater setback from major transportation noise sources, I-5 and SR 70/99, thereby reducing and perhaps eliminating exterior and interior noise level exceedances at sensitive receptors. However, because of the constrained nature of the site and the need to locate the elementary school outside the overflight safety zone of the Sacramento International Airport, it may not be feasible to relocate the elementary school such that the benefit of increased noise reduction could be achieved. Overall, this alternative would reduce noise impacts on some noise-sensitive land uses and impacts would be less than impacts under the project [Less].

8.3.4 UTILITIES

Under this alternative, public utility demands would be approximately 20% less; however, these impacts are less than significant or less than significant with mitigation for the project. No significant utilities impacts were identified for the project after mitigation, so this alternative would not reduce or avoid any such impacts. Indirect impacts related to regional improvement projects (i.e., wastewater treatment expansion) would be similar. Overall, this alternative would result in similar environmental impacts (i.e., based on CEQA thresholds) as the project, although unit demands for utility services would be less because this alternative would reduce the total population living on-site [*Similar*].

8.3.5 PUBLIC SERVICES

Under this alternative, public services demands would be approximately 20% less; however, these impacts are less than significant or less than significant with mitigation for the project. No significant utilities impacts were identified for the project after mitigation, so this alternative would not reduce or avoid any such impacts. Overall, this alternative would result in similar environmental impacts (i.e., based on CEQA thresholds) as the project, although unit demands for public services would be less because this alternative would reduce the total population living on-site [*Similar*].

8.3.6 PARKS AND OPEN SPACE

Although reduced in size, it is assumed that this alternative would provide comparable parkland as the project and would meet the City's standard for parkland dedication (5 acres per 1,000 new residents). Based on a population of 7,141 residents, approximately 35.71 acres of parkland would be provided under this alternative. However, because of the need to provide buffers around the perimeters of the project site to reduce noise and air quality impacts associated with traffic on I-5 and SR 70/99 and the constraints associated with the airport safety zone, it may be potentially infeasible for this alternative to provide a community park (i.e., a park of 23 acres or more). Nonetheless, it is expected that this alternative would meet its park demand requirements. This alternative would convert approximately 20% less open space areas because of its reduced size. Therefore, the proposed project and this alternative would have similar effects related to parks and open space [*Similar*].

8.3.7 AESTHETICS

Under this alternative there would be the same alteration of views, but at a reduced scale, of the project site from surrounding lands including I-5, SR 70/99, and local roadways. This impact was identified as significant and unavoidable with the project. With this alternative, this impact would also be considered significant and unavoidable because the viewshed would substantially changed from existing conditions, similar to what would occur with the project. Lighting would be slightly less under this alternative, but lighting impacts were not identified as significant project impacts. Overall, aesthetic resources impacts would be perceived as nearly the same as the project because the site would be substantially converted from any open space to a developed use [*Similar*].

8.3.8 PUBLIC HEALTH AND HAZARDS

In general, this alternative would result in the same land uses and same project amenities, including the proposed light rail station. This alternative would reduce the number of houses within the overflight safety zone of the Sacramento International Airport, thereby reducing potential safety risks associated with airport operations. This alternative would, however, include a proposed light rail station, commercial uses, and parks, which would be incompatible with safety standards of the Sacramento International Airport's CLUP. Further, this alternative would also locate a lake/detention basin within the airport safety zone, which could create potential bird strike hazards for commercial aircraft. However, implementation of mitigation recommended for the project would

reduce this impact to a less-than-significant level. Overall, this alternative would reduce the development and land uses that would fall within the airport safety zone, thereby reducing the number of residents and tenants who are exposed to potential aircraft hazards. Therefore, this alternative would result in less public health and hazards impacts [*Less*].

8.3.9 GEOLOGY AND SOILS

Under this alternative there would be a reduction in project development; therefore, impacts related to construction erosion and risks from seismic and soil hazards would be reduced. Nonetheless, because of its substantial size (i.e., greater than 15 acres), this alternative would include the same soil-erosion (i.e., preparation of a SWPPP) and soil-hazards mitigation measures as the project; therefore, postmitigation impacts would not change (i.e., impacts would be less than significant). Therefore, this alternative would result in similar geology and soils impacts [*Similar*].

8.3.10 HYDROLOGY, DRAINAGE, AND WATER QUALITY

In general, this alternative would result in the same hydrology and water quality impacts as the project because a substantially similar but somewhat reduced level of development would occur. This alternative would reduce the volumes of stormwater discharges from the site. Nevertheless, because both the project and this alternative would be designed in accordance with City drainage standards, would ensure that sufficient capacity exists in off-site drainage facilities, and would implement BMPs for water quality, this alternative would result in similar hydrology and water quality impacts. Similar to the project, this alternative would be located in an area identified as being at risk of levee failure and that could be subject to flooding risks. ~~that is located outside the Federal Emergency Management Agency's (FEMA) 100-year floodplain. Therefore, less than significant flooding impacts would occur.~~ This alternative would also contribute to the need for construction of levee improvements, the construction of which could result in significant and unavoidable impacts. Therefore, the proposed project and reduced size alternative would have similar hydrology, drainage, and water quality effects [*Similar*].

8.3.11 AGRICULTURE

The viability of the buffer areas on the project site (i.e., long, narrow 200- to 400-foot wide strips of land) for agricultural operations would likely be infeasible. In general, large areas dedicated to agricultural operations are needed to have a viable farming operation. Further, potential land use incompatibilities (e.g., air, noise) associated with agricultural operations adjacent to urban development increases the likelihood that a viable agricultural operation surrounding the project site would not occur. Therefore, although the footprint of this alternative would result in less development and direct conversion of Important Farmland, the net effect because of land use compatibilities and lack of viable farming properties would be similar to that of the project (i.e., conversion of 518 acres of Important Farmland) and with mitigation would be significant and unavoidable. This alternative would reduce the acreage of open space converted to urban land uses; however, because of the substantial size of this alternative and the lack of full compensatory mitigation, this impact would remain significant and unavoidable. Nonetheless, this alternative would reduce impacts on Important Farmland and overall impacts would be less [*Less*].

8.3.12 BIOLOGICAL RESOURCES

This alternative would reduce the development footprint of the project site and would increase the buffer area along the western, eastern, and southern boundaries of the site (i.e., up to 400 feet). Therefore, this alternative would reduce overall impacts on giant garter snake. Further, similar mitigation to enhance giant garter snake habitat at off-site locations would also be provided. There would be increased Swainson's hawk foraging habitat at the site under this alternative. Other habitat and species impacts would be comparable under this alternative, but would occur to a lesser degree (e.g., wetland impacts). Overall, this alternative would result in less biological

resources impacts. However, because less of the site would be developed, less off-site mitigation would need to be purchased and enhanced for the benefit of species affected. The establishment of off-site preserves designed for the benefit of species is intended to fully offset the impacts of project development. Under this alternative, the need for off-site mitigation would be less. Because the mitigation is designed to offset the impacts, impacts under this alternative would be similar to impacts under the project.*[Similar]*.

8.3.13 CULTURAL RESOURCES

Because this alternative would result in development of the majority of the project site and ground-disturbing activities would occur across the site, impacts on unknown archaeological resources would be potentially significant with this alternative, similar to those of the project. However, with implementation of mitigation recommended for the project, this impact would be reduced to a less-than-significant level. This alternative would not reduce or avoid and significant cultural resource impact of the project, so overall cultural resource impacts would be similar to impacts of the project *[Similar]*.

8.3.14 PROJECT OBJECTIVES

The reduced size alternative would meet most if not all of the project's objectives, including those related to creation of a pedestrian-friendly development; development of a project that is generally consistent with SACOG's Blueprint development plan; development of a residential development near the major employment centers of downtown Sacramento and Metro Air Park; provision of vertically and horizontally mixed neighborhoods; incorporation of parks and open space in a manner that provides connectivity; and creating a residential development with a variety of housing types. However, because of its reduced size and reduced population densities, the reduced size alternative may not provide a sufficient population base to support the construction of a light rail station on the project site and it would not provide as great a benefit toward meeting the City's long-term housing and employment demand projections.

8.4 CONSIDERATION OF NO PROJECT ALTERNATIVE—CONTINUATION OF EXISTING LAND USES

The key objective of the no project alternative is to continue existing land use activities on the project site consistent with Sacramento County's agricultural land use designations for the site. The project site has been or is currently in agricultural production and agricultural support uses. The majority of the site currently consists of rice fields/former rice fields and associated water canals. A racehorse training facility was previously located in the northwest corner of the project site but has been demolished, and only remnant building foundations and the dirt racetrack remain. This alternative would not develop the project site with urban land uses and the project site would continue to operate in an agricultural/farming capacity, including rice and row crop cultivation.

8.4.1 TRANSPORTATION AND CIRCULATION

The no project alternative would not develop any urban land uses on the project site. Therefore, traffic volumes on local roadways would not increase as a result of the project. Because no changes in land uses would occur from existing conditions, this alternative would not generate any increased daily vehicle trips and would not cause any impacts on local roadways or intersections. Therefore, this alternative would eliminate the project's significant and unavoidable transportation impacts on local intersections, roadway segments, freeway ramps, and freeway segments. Overall, the no project alternative would result in substantially less transportation and circulation impacts than the project *[Less]*.

8.4.2 AIR QUALITY

Because the no project alternative would not develop any urban land uses on the project site, and no construction activities would occur, this alternative would not generate any construction- or operational-related air emissions (e.g., ROG, NO_x, PM₁₀, or TACs). The project would result in significant and unavoidable impacts related to construction emissions, increases in stationary-source TACs, and long-term regional emissions. Implementation of the no project alternative would eliminate these impacts. However, farming activities would likely occur at the site, and these activities would result in the generation of fugitive dust emissions associated with disking and plowing activities. Quantified dust emissions associated with on-site farming operation are known; depending on the crops that are produced and how crops are rotated at the site, this alternative could result in the substantial generation of fugitive dust emissions. However, because of their intermittent nature, such emissions would not likely result in significant air quality impacts. Overall, this alternative would reduce or eliminate the project's significant and unavoidable air quality impacts; therefore, impacts would be less *[Less]*.

8.4.3 NOISE

No construction activities would occur under this alternative because no development would occur. As a result, this alternative would eliminate the project's construction-related noise impacts; however, these impacts are reduced to a less-than-significant level with implementation of recommended mitigation. Noise impacts associated with aircraft overflights would not occur because no new residential land uses would be developed on-site. Further, mobile-source noise impacts associated with traffic on I-5 and SR 70/99 would not occur because no residences would be located in close proximity to these noise sources. Implementation of this alternative would eliminate all of the project's significant and unavoidable noise impacts *[Less]*.

8.3.4 UTILITIES

No increased demands for utility services would occur under this alternative because no new development would occur. While the project's utility impacts were determined to be less than significant with mitigation, this alternative would not result in the need to construct or extend existing utilities to the site, the construction of which could result in significant environmental effects. As such, this alternative would result in less utility impacts than the project *[Less]*.

8.4.5 PUBLIC SERVICES

Under this alternative, demand for public services would not occur. Although no significant public services impacts were identified for the project after mitigation, this alternative would not create the need to extend public services (e.g., fire protection, law enforcement, schools) to the project site. As such, this alternative would result in less utility impacts than the project *[Less]*.

8.4.6 PARKS AND OPEN SPACE

Because the no project alternative would not develop any urban land uses, this alternative would not require development or dedication of parkland as defined by City standards and would have no demands for park facilities. Further, no open space lands would be converted. For these reasons, this alternative would have less effects related to parks and open space *[Less]*.

8.4.7 AESTHETICS

The no project alternative would not develop any urban land uses on the project site. Therefore, alteration of existing views from surrounding lands including I-5, SR 70/99, and local roadways would not occur. This impact was identified as significant and unavoidable with the project. With this alternative, this impact would not occur

because the viewshed would not change from existing conditions. Overall, aesthetic resource impacts would be perceived as less than under the proposed project because the site would not convert from existing agricultural land uses to a developed use [Less].

8.4.8 PUBLIC HEALTH AND HAZARDS

Under this alternative no new development would occur; therefore, no residents or tenants of the site would be exposed to aircraft safety hazards (i.e., bird strikes) associated with the location of a lake/detention basin on-site. However, this impact would be reduced to a less-than-significant level with implementation of recommended mitigation under the project. This alternative would eliminate this potential safety impact, and it would also eliminate the project's potential inconsistency with the CLUP because no land uses are proposed that would be inconsistent with development standards in the CLUP (i.e., parks, commercial, light rail station). This alternative eliminates the project's interim significant and unavoidable flooding hazard impacts because no housing would be located on the project site. Therefore, the no project alternative would result in less public health and hazards impacts than the project [Less].

8.4.9 GEOLOGY AND SOILS

Under this alternative there would be no development of urban land uses; therefore, impacts related to construction erosion and risks from seismic and soil hazards would not occur. While farming activities at the site could result in exposed soils, which could lead to potential erosion impacts, these impacts are anticipated to be minor and would not increase from existing conditions. This alternative would not construct any buildings or structures on the project site and, as a result, would not result in any soil hazard impacts (e.g., liquefaction, soil expansion). Overall, the no project alternative would result in less geology and soils impacts than the proposed project [Less].

8.4.10 HYDROLOGY AND WATER QUALITY

This alternative would reduce the volumes of stormwater discharges from the site because development of urban land uses would not occur. Further, this alternative would not develop land uses (e.g., homes, structures) that would be subject to a flooding risk during storm events. While this alternative would be located in an area identified as being at risk of levee failure and that could be subject to flooding risks, this alternative would not contribute to the need for construction of levee improvements because no housing would be developed on-site; therefore, this alternative would not expose residents or place housing in a flood hazard area. flooding impacts would be less than significant. Therefore, this alternative would result in less hydrology and water quality impacts than the project because no structures would be constructed on-site [Less].

8.4.11 AGRICULTURE

Agricultural operations on the project site would continue under this alternative and the potential for conflicts between urban land uses and surrounding agricultural operations would not occur. Further, implementation of this alternative would not result in the conversion of any Important Farmland to urban land uses. Therefore, impacts on agriculture would be less than under the proposed project [Less].

8.4.12 BIOLOGICAL RESOURCES

This alternative would not develop any urban land uses on the project site and existing biological and wildlife habitats on the project site would remain unchanged. As a result, this alternative would avoid the project's significant biological resource impacts; however, these impacts would be reduced to a less-than-significant level with implementation of recommended mitigation. It is important to note that this alternative would not provide

any mitigation lands that would serve to enhance giant garter snake habitat in the local area at an off-site location. Nonetheless, this alternative would result in less overall biological resource impacts [Less].

8.4.13 CULTURAL RESOURCES

Although this alternative would not result in development of the project site, ground-disturbing activities (i.e., disking and plowing) would still occur on the project site. However, these activities would likely not extend to the same depths as under the project (i.e., 2–3 feet versus 10–15 feet). Nonetheless, because ground-disturbing activities would continue, this alternative would result in the same potentially significant impacts associated with the discovery of previously undiscovered cultural resources. Mitigation recommended for the project would reduce these impacts to a less-than-significant level. Therefore, this alternative would result in similar cultural resource impacts [Similar].

8.4.14 PROJECT OBJECTIVES

The no project alternative would not meet any of the project’s objectives, including those related to development of a light rail station; creation of a pedestrian-friendly development; development of a project that is generally consistent with SACOG’s Blueprint development plan; development of a residential development near the major employment centers of downtown Sacramento and Metro Air Park; provision of vertically and horizontally mixed neighborhoods; incorporation of parks and open space in a manner that provides connectivity; and creating a residential development with a variety of housing types along the Downtown-Natomas-Airport light rail line. This alternative would not further the City’s goal to provide sufficient and additional housing opportunities to area residents and would not contribute to meeting long-term housing and employment demand projections.

8.5 SUMMARY OF COMPARATIVE EFFECTS OF THE PROJECT SITE ALTERNATIVES

Table 8-1 summarizes the environmental analysis provided above for the off-site alternative, dispersed development alternative, reduced size alternative, and no project alternative.

Table 8-1 Comparison of Environmental Impacts of Alternatives in Relation to the Proposed Project				
Issue Area	No Project Alternative— Continuation of Existing Land Uses (NP)	Off-site Alternative	Dispersed Development Alternative	Reduced Size Alternative
Traffic and Circulation	Less	Less	Greater or Less	Less
Air Quality	Less	Similar or Less	Similar or Less	Less
Noise	Less	Less	Less	Less
Utilities	Less	Less	Less	Similar
Public Services	Less	Less	Less	Similar
Parks and Open Space	Less	Less	Less	Similar
Aesthetics	Less	Less	Less	Similar
Public Health and Hazards	Less	Less	Less	Less
Geology and Soils	Less	Similar	Similar	Similar
Hydrology and Water Quality	Less	Similar	Similar	Similar
Agriculture	Less	Less	Less	Less
Biological Resources	Less	Less	Similar	Similar
Cultural Resources	Similar	Similar	Similar	Similar

8.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

In addition to the discussion and comparison of impacts of the alternatives to the proposed project, CEQA requires that an “environmentally superior” alternative among the alternatives considered be selected and the reasons for such selection be disclosed. In general, the environmentally superior alternative is the alternative that would generate the fewest or least severe adverse impacts. In the case of the project, the no project alternative is the environmentally superior alternative because it would not create any new site-specific adverse environmental impacts. However, CEQA requires the identification of another environmentally superior alternative when the “no project” alternative is identified as environmentally superior (State CEQA Guidelines Section 15126[e][2]).

The reduced size alternative would be environmentally superior to the project because it would substantially reduce the project’s traffic, air, noise, farmland, and biological resources impacts. Further, it would meet most project objectives including supporting light rail and creating a development consistent with SACOG’s Blueprint.

An off-site alternative within the existing boundaries of the NNCP would be environmentally superior to the project and to the reduced size alternative. This alternative is the overall superior alternative because it would avoid the project’s significant aircraft safety hazard impact associated with compatibility with CLUP standards and it would substantially reduce traffic, farmland, biological, air quality, and noise impacts. Further, it would meet most if not all project objectives. However, a site within the NNCP is not currently owned by the project applicant and all land in the NNCP area is currently proposed for development. Therefore, it is not known whether the off-site alternative considered in this analysis is feasible. Further, this alternative would not meet the key project objective of providing a development along the Downtown-Natomas-Airport light rail line.

The dispersed development alternative would not be environmentally superior to the project. This alternative would avoid the project’s significant aircraft safety hazard impacts associated with compatibility with CLUP standards and would substantially reduce traffic, farmland, biological, air quality, and noise impacts; however, depending on localized conditions, it could result in greater transportation impacts than the project. Further, multiple sites within the city limits or SOI are not owned by the project applicant, and most land with the City is currently proposed for development. Therefore, it is not known whether the theoretical off-site alternative considered in this analysis is feasible. Further, development of an alternative in a dispersed nature would not achieve the key project objectives related to providing residential development that would support development of a light rail station along the Downtown-Natomas-Airport light rail line.

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10 REPORT PREPARATION

10.1 CO-LEAD AGENCIES

CITY OF SACRAMENTO

DEVELOPMENT SERVICES DEPARTMENT

Lezley Buford..... Environmental Planning Services Manager
Tom Buford Associate Planner
David Kwong Senior Planner
Carol Shearly New Growth Manager
Arwen Wacht..... Associate Planner
Samar Hajeer Associate Civil Engineer
Scott Tobey..... Development Engineering & Finance
Sabina Gilbert..... Legal Counsel
Joe Cerullo..... Legal Counsel

SACRAMENTO COUNTY LOCAL AGENCY FORMATION COMMISSION

Peter Brundage Executive Officer
Don Lockhart..... Assistant Executive Officer
Nancy Miller..... Legal Counsel
Bob Klousner Planning Consultant

10.2 EIR CONSULTANT

EDAW, INC.

Gary Jakobs, AICP Principal-in-Charge
Amanda Olekszulyn Project Manager
John Hope..... Project Coordinator/Environmental Analyst
Julie Nichols Environmental Analyst
Honey Walters Senior Air Quality/Noise Specialist
Austin Kerr Air Quality/Noise Specialist
Leo Edson..... Senior Wildlife Biologist
Bob Solecki Wildlife Biologist
Kristin Heckman..... Wildlife Biologist
John Hunter Senior Restoration Ecologist
Brian Ludwig..... Senior Archaeologist
Brian Perry Graphics
Lorrie Jo Williams..... Graphics
Lisa Clement..... GIS Specialist
Chris Donohue..... GIS Specialist
Debbie Jew Word Processing
Gayiety Lane Word Processing
Amber Martin Word Processing

APPENDIX D

AIR QUALITY MODELING DATA

SMAQMD CO SCREENING ANALYSIS WORKSHEET

	EXISTING ISOPLETH CONC.	PREDICTED CONCENTRATION (ppm)*	
		PHASE I (YR 2009)	PHASE I & II (YR2012)
BACKGROUND CONCENTRATIONS 1-HR	6	3.06	2.64
BACKGROUND CONCENTRATIONS 8-HR	3	1.53	1.32
ESTIMATED DAILY TRIPS - PHASE I:**	11,178.85		
ESTIMATED DAILY TRIPS - PHASE II:**	24,352.06		
TOTAL DAILY TRIPS - PHASE I & II:	35,530.91		
CALCULATED PEAK-HOUR TRIPS - PHASE I:	1,117.89		
CALCULATED PEAK-HOUR TRIPS - PHASE I & II:	3,553.09		
PREDICTED CO CONCENTRATION CONTRIBUTION:**			
	1-HR	3.1	9.2
	8-HR	2.17	6.5
TOTAL PREDICTED CONCENTRATION:			
	1-HR	6.16	11.84
	8-HR	3.7	7.8
CALIFORNIA AMBIENT AIR QUALITY STANDARDS (CAAQS):			
	1-HR	20	
	8-HR	9.0	
PREDICTED CONCENTRATIONS EXCEED CAAQS?			
	1-HR	NO	NO
	8-HR	NO	NO

** Project's contribution to local CO concentrations based on a trend analysis of SMAQMD-recommended contribution values (see attached worksheet).

* Daily trip generation rates were calculated based on proposed land uses identified in the Project development phasing plan and the trip generation rates for corresponding land uses obtained from the traffic analysis prepared for this project.

PREDICTED PROJECT CO CONTRIBUTION WORKSHEET

	PEAK HOUR VOLUME	PPM CO	
		1-HOUR	8-HOUR
SMAQMD-RECOMMENDED VALUES	100	0.4	0.28
	200	0.7	0.49
	300	1.1	0.77
	500	1.7	1.19
	1000	3.1	2.17
	2000	5.6	3.92
	3000	7.7	5.39
TREND VALUES	3400	8.9	6.2
	3500	9.2	6.5
	3600	9.5	6.7
	3700	9.8	6.9
	3800	10.1	7.1
*Trend values are approximate, based on trend analysis of SMAQMD-recommended contribution values.			

**URBEMIS 8.7 MODELING OUTPUT FOR SITE PREPARATION OF ENTIRE
SITE AND OPERATION OF ALL PROPOSED USES**

URBEMIS MODELING OUTPUT FILE

INITIAL SITE PREPARATION
OPERATIONAL EMISSIONS - BUILDOUT

URBEMIS 2002 For Windows 8.7.0

file Name: H:\Projects2_6\Greenbriar\GradingandOperation1_2.urb
project Name: Greenbriar Grading of Entire Site and Operational Emissions
project Location: Lower Sacramento Valley Air Basin
on-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007 *** TOTALS (lbs/day,unmitigated)	94.07	638.70	762.74	0.01	1,468.43	25.87	1,442.56

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	184.89	49.15	113.77	0.58	0.38

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	233.43	216.87	2,201.43	1.42	240.73

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	418.32	266.02	2,315.19	2.00	241.12

URBEMIS 2002 For Windows 8.7.0

File Name: H:\Projects2_6\Greenbriar\GradingandOperation1_2.urb
Project Name: Greenbriar Grading of Entire Site and Operational Emissions
Project Location: Lower Sacramento Valley Air Basin
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007 *** TOTALS (lbs/day,unmitigated)	94.07	638.70	762.74	0.01	1,468.43	25.87	1,442.56

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	2,144.87	115.00	3,628.41	8.57	537.48

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	237.38	323.26	2,642.72	1.41	240.73

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	2,382.25	438.27	6,271.13	9.98	778.22

File Name: H:\Projects2_6\Greenbriar\GradingandOperation1_2.urb
 Project Name: Greenbriar Grading of Entire Site and Operational Emissions
 Project Location: Lower Sacramento Valley Air Basin
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
 (Pounds/Day - Winter)

Construction Start Month and Year: June, 2007
 Construction Duration: 60
 Total Land Use Area to be Developed: 577 acres
 Maximum Acreage Disturbed Per Day: 144.25 acres
 Single Family Units: 2886 Multi-Family Units: 587
 Retail/Office/Institutional/Industrial Square Footage: 732312

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	1,442.50	-	1,442.50
Off-Road Diesel	92.89	637.27	737.07	-	25.83	25.83	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	1.18	1.43	25.67	0.01	0.10	0.04	0.06
Maximum lbs/day	94.07	638.70	762.74	0.01	1,468.43	25.87	1,442.56
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max lbs/day all phases	94.07	638.70	762.74	0.01	1,468.43	25.87	1,442.56

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
 Start Month/Year for Phase 2: Jun '07
 Phase 2 Duration: 6.6 months
 On-Road Truck Travel (VMT): 0
 Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
15	Crawler Tractors	143	0.575	8.0
15	Graders	174	0.575	8.0
15	Off Highway Tractors	255	0.410	8.0
15	Rubber Tired Loaders	165	0.465	8.0

Phase 3 - Building Construction Assumptions
 Start Month/Year for Phase 3: Dec '07
 Phase 3 Duration: 53.4 months
 SubPhase Building Turned OFF
 SubPhase Architectural Coatings Turned OFF
 SubPhase Asphalt Turned OFF

02/10/2006 2:10 PM

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)						
Source	ROG	NOx	CO	SO2	PM10	
Natural Gas	3.65	47.67	23.22	0	0.09	
Hearth	1,971.31	67.34	3,605.19	8.57	537.39	
Landscaping - No winter emissions						
Consumer Prdcts	169.91	-	-	-	-	
Architectural Coatings	0.00	-	-	-	-	
TOTALS (lbs/day, unmitigated)	2,144.87	115.00	3,628.41	8.57	537.48	

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing low	115.03	171.78	1,356.52	0.78	133.45
Apartments/Senior/Mixed-U	23.39	34.93	275.80	0.16	27.13
Elementary school	8.58	11.23	92.58	0.05	8.19
park/water/openspace/oth	0.00	0.00	0.00	0.00	0.00
Community/Village Commerc	90.39	105.33	917.82	0.42	71.96
TOTAL EMISSIONS (lbs/day)	237.38	323.26	2,642.72	1.41	240.73

Includes correction for passby trips.

Includes the following double counting adjustment for internal trips:

Residential trips: 11.13 % reduction. Nonresidential trips: 11.32 % reduction.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 40 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Single family housing low	226.10	5.97 trips/dwelling unit	2,886.00	17,241.31
Apartments/Senior/Mixed-U	29.90	5.97 trips/dwelling unit	587.00	3,505.45
Elementary school		3.54 trips/1000 sq. ft.	444.31	1,572.89
park/water/openspace/oth		0.00 trips/acres	283.40	0.00
Community/Village Commerc		65.28 trips/1000 sq. ft.	288.00	18,799.37
Sum of Total Trips				41,119.02
Total Vehicle Miles Traveled				158,491.01

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	9.7	3.8	4.6	7.8	4.5	4.5
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	27.3	21.2	51.5			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
park/water/openspace/other				0.0	0.0	100.0
Community/Village Commercial				2.0	1.0	97.0

URBEMIS 2002 For Windows 8.7.0

File Name: H:\Projects2_6\Greenbriar\GradingandOperation1_2.urb
 Project Name: Greenbriar Grading of Entire Site and Operational Emissions
 Project Location: Lower Sacramento Valley Air Basin
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
 (Pounds/Day ~ Summer)

Construction Start Month and Year: June, 2007
 Construction Duration: 60
 Total Land Use Area to be Developed: 577 acres
 Maximum Acreage Disturbed Per Day: 144.25 acres
 Single Family Units: 2886 Multi-Family Units: 587
 Retail/Office/Institutional/Industrial Square Footage: 732312

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	1,442.50	-	1,442.50
Off-Road Diesel	92.89	637.27	737.07	-	25.83	25.83	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	1.18	1.43	25.67	0.01	0.10	0.04	0.06
Maximum lbs/day	94.07	638.70	762.74	0.01	1,468.43	25.87	1,442.56
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max lbs/day all phases	94.07	638.70	762.74	0.01	1,468.43	25.87	1,442.56

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
 Start Month/Year for Phase 2: Jun '07
 Phase 2 Duration: 6.6 months
 On-Road Truck Travel (VMT): 0
 Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
15	Crawler Tractors	143	0.575	8.0
15	Graders	174	0.575	8.0
15	Off Highway Tractors	255	0.410	8.0
15	Rubber Tired Loaders	165	0.465	8.0

Phase 3 - Building Construction Assumptions
 Start Month/Year for Phase 3: Dec '07
 Phase 3 Duration: 53.4 months
 SubPhase Building Turned OFF
 SubPhase Architectural Coatings Turned OFF
 SubPhase Asphalt Turned OFF

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	3.65	47.67	23.22	0	0.09
Hearth - No summer emissions					
Landscaping	11.33	1.48	90.55	0.58	0.29
Consumer Prdcts	169.91	-	-	-	-
Architectural Coatings	0.00	-	-	-	-
TOTALS(lbs/day,unmitigated)	184.89	49.15	113.77	0.58	0.38

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing low	123.48	114.55	1,189.15	0.79	133.45
Apartments/Senior/Mixed-U	25.11	23.29	241.78	0.16	27.13
Elementary school	11.50	7.55	75.81	0.05	8.19
park/water/openspace/oth	3.15	0.00	0.00	0.00	0.00
Community/Village Commerc	70.20	71.48	694.69	0.43	71.96
TOTAL EMISSIONS (lbs/day)	233.43	216.87	2,201.43	1.42	240.73

Includes correction for passby trips.

Includes the following double counting adjustment for internal trips:

Residential trips: 11.13 % reduction. Nonresidential trips: 11.32 % reduction.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 85 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Single family housing low	226.10	5.97 trips/dwelling unit	2,886.00	17,241.31
Apartments/Senior/Mixed-U	29.90	5.97 trips/dwelling unit	587.00	3,505.45
Elementary school		3.54 trips/1000 sq. ft.	444.31	1,572.89
park/water/openspace/oth		0.00 trips/acres	283.40	0.00
Community/Village Commerc		65.28 trips/1000 sq. ft.	288.00	18,799.37
Sum of Total Trips				41,119.02
Total Vehicle Miles Traveled				158,491.01

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	54.70	1.10	98.70	0.20
Light Truck < 3,750 lbs	15.20	2.00	96.00	2.00
Light Truck 3,751- 5,750	16.20	1.20	98.10	0.70
Med Truck 5,751- 8,500	7.30	1.40	95.90	2.70
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.60	68.80	31.20	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.40	7.10	85.70	7.20

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	9.7	3.8	4.6	7.8	4.5	4.5
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	27.3	21.2	51.5			

% of Trips - Commercial (by land use)

Elementary school	20.0	10.0	70.0
park/water/openspace/other	0.0	0.0	100.0
Community/Village Commercial	2.0	1.0	97.0

**URBEMIS 8.7 MODELING OUTPUT FOR BUILDING OF PROPOSED USES
NORTH OF MEISTER**

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\greenbriar_buildingconstructi
 Project Name: Greenbriar Grading of Entire Site and Operational Emissions
 Project Location: Lower Sacramento Valley Air Basin
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
 (Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007 ***							
TOTALS (lbs/day,unmitigated)	54.37	265.66	736.15	0.27	12.65	11.38	1.27
*** 2008 ***							
TOTALS (lbs/day,unmitigated)	53.68	253.78	737.02	0.27	11.72	10.45	1.27
*** 2009 ***							
TOTALS (lbs/day,unmitigated)	52.96	241.54	737.71	0.27	11.09	9.82	1.27
*** 2010 ***							
TOTALS (lbs/day,unmitigated)	78.65	356.55	897.80	0.30	13.73	12.42	1.31

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\greenbriar_buildingconstruct
 Project Name: Greenbriar Grading of Entire Site and Operational Emissions
 Project Location: Lower Sacramento Valley Air Basin
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
 (Pounds/Day - Winter)

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007 *** TOTALS (lbs/day,unmitigated)	54.37	265.66	736.15	0.27	12.65	11.38	1.27
*** 2008 *** TOTALS (lbs/day,unmitigated)	53.68	253.78	737.02	0.27	11.72	10.45	1.27
*** 2009 *** TOTALS (lbs/day,unmitigated)	52.96	241.54	737.71	0.27	11.09	9.82	1.27
*** 2010 *** TOTALS (lbs/day,unmitigated)	78.65	356.55	897.80	0.30	13.73	12.42	1.31

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\greenbriar_buildingconstruction
 Project Name: Greenbriar Grading of Entire Site and Operational Emissions
 Project Location: Lower Sacramento Valley Air Basin
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Winter)

Construction Start Month and Year: June, 2007
 Construction Duration: 36
 Total Land Use Area to be Developed: 302.77 acres
 Maximum Acreage Disturbed Per Day: 75.7 acres
 Single Family Units: 1689 Multi-Family Units: 307
 Retail/Office/Institutional/Industrial Square Footage: 288000

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	31.14	237.57	230.41	-	10.59	10.59	0.00
Bldg Const Worker Trips	23.24	28.08	505.74	0.27	2.06	0.79	1.27
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	54.37	265.66	736.15	0.27	12.65	11.38	1.27
Max lbs/day all phases	54.37	265.66	736.15	0.27	12.65	11.38	1.27
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	31.14	226.05	238.82	-	9.65	9.65	0.00
Bldg Const Worker Trips	22.54	27.72	498.20	0.27	2.06	0.79	1.27
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	53.68	253.78	737.02	0.27	11.72	10.45	1.27
Max lbs/day all phases	53.68	253.78	737.02	0.27	11.72	10.45	1.27
*** 2009***							

Phase 1 - Demolition Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 3 - Building Construction

Bldg Const Off-Road Diesel	31.14	214.22	247.54	-	9.03	9.03	0.00
Bldg Const Worker Trips	21.83	27.32	490.17	0.27	2.06	0.79	1.27
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	52.96	241.54	737.71	0.27	11.09	9.82	1.27
Max lbs/day all phases	52.96	241.54	737.71	0.27	11.09	9.82	1.27

*** 2010***

Phase 1 - Demolition Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 3 - Building Construction

Bldg Const Off-Road Diesel	31.14	202.70	255.94	-	8.10	8.10	0.00
Bldg Const Worker Trips	21.16	26.94	482.58	0.27	2.06	0.79	1.27
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	6.06	-	-	-	-	-	-
Asphalt Off-Road Diesel	20.13	116.73	171.06	-	3.22	3.22	0.00
Asphalt On-Road Diesel	0.75	11.42	2.76	0.03	0.33	0.31	0.02
Asphalt Worker Trips	0.09	0.04	1.12	0.00	0.02	0.00	0.02
Maximum lbs/day	78.65	356.55	897.80	0.30	13.73	12.42	1.31
Max lbs/day all phases	78.65	356.55	897.80	0.30	13.73	12.42	1.31

Phase 2 - Site Grading Assumptions: Phase Turned OFF

Phase 3 - Building Construction Assumptions

Start Month/Year for Phase 3: Jun '07
 Phase 3 Duration: 36 months
 Start Month/Year for SubPhase Building: Jun '07
 SubPhase Building Duration: 36 months
 Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
15	Other Equipment	190	0.620	8.0

SubPhase Architectural Coatings Turned OFF
 Start Month/Year for SubPhase Asphalt: Apr '10
 SubPhase Asphalt Duration: 1.8 months
 Acres to be Paved: 91.6
 Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
9	Pavers	132	0.590	8.0
9	Rollers	114	0.430	8.0

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\greenbriar_buildingconstructio
 Project Name: Greenbriar Grading of Entire Site and Operational Emissions
 Project Location: Lower Sacramento Valley Air Basin
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

Construction Start Month and Year: June, 2007
 Construction Duration: 36
 Total Land Use Area to be Developed: 302.77 acres
 Maximum Acreage Disturbed Per Day: 75.7 acres
 Single Family Units: 1689 Multi-Family Units: 307
 Retail/Office/Institutional/Industrial Square Footage: 288000

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2007***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	31.14	237.57	230.41	-	10.59	10.59	0.00
Bldg Const Worker Trips	23.24	28.08	505.74	0.27	2.06	0.79	1.27
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	54.37	265.66	736.15	0.27	12.65	11.38	1.27
Max lbs/day all phases	54.37	265.66	736.15	0.27	12.65	11.38	1.27
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	31.14	226.05	238.82	-	9.65	9.65	0.00
Bldg Const Worker Trips	22.54	27.72	498.20	0.27	2.06	0.79	1.27
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	53.68	253.78	737.02	0.27	11.72	10.45	1.27
Max lbs/day all phases	53.68	253.78	737.02	0.27	11.72	10.45	1.27
*** 2009***							

Phase 1 - Demolition Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 3 - Building Construction

Bldg Const Off-Road Diesel	31.14	214.22	247.54	-	9.03	9.03	0.00
Bldg Const Worker Trips	21.83	27.32	490.17	0.27	2.06	0.79	1.27
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	52.96	241.54	737.71	0.27	11.09	9.82	1.27
Max lbs/day all phases	52.96	241.54	737.71	0.27	11.09	9.82	1.27

*** 2010***

Phase 1 - Demolition Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 3 - Building Construction

Bldg Const Off-Road Diesel	31.14	202.70	255.94	-	8.10	8.10	0.00
Bldg Const Worker Trips	21.16	26.94	482.58	0.27	2.06	0.79	1.27
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	6.06	-	-	-	-	-	-
Asphalt Off-Road Diesel	20.13	116.73	171.06	-	3.22	3.22	0.00
Asphalt On-Road Diesel	0.75	11.42	2.76	0.03	0.33	0.31	0.02
Asphalt Worker Trips	0.09	0.04	1.12	0.00	0.02	0.00	0.02
Maximum lbs/day	78.65	356.55	897.80	0.30	13.73	12.42	1.31
Max lbs/day all phases	78.65	356.55	897.80	0.30	13.73	12.42	1.31

Phase 2 - Site Grading Assumptions: Phase Turned OFF

Phase 3 - Building Construction Assumptions

Start Month/Year for Phase 3: Jun '07

Phase 3 Duration: 36 months

Start Month/Year for SubPhase Building: Jun '07

SubPhase Building Duration: 36 months

Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
15	Other Equipment	190	0.620	8.0

SubPhase Architectural Coatings Turned OFF

Start Month/Year for SubPhase Asphalt: Apr '10

SubPhase Asphalt Duration: 1.8 months

Acres to be Paved: 91.6

Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
9	Pavers	132	0.590	8.0
9	Rollers	114	0.430	8.0

**URBEMIS 8.7 MODELING OUTPUT FOR BUILDING OF
PROPOSED USES SOUTH OF MEISTER**

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\greenbriar_buildingconstruction
 Project Name: Greenbriar Building Construction of Phase 2
 Project Location: Lower Sacramento Valley Air Basin
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
 (Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2009 *** TOTALS (lbs/day,unmitigated)	42.95	210.88	556.31	0.21	9.71	8.72	0.99
*** 2010 *** TOTALS (lbs/day,unmitigated)	42.43	200.21	557.96	0.21	8.87	7.88	0.99
*** 2011 *** TOTALS (lbs/day,unmitigated)	42.43	200.21	557.96	0.21	8.87	7.88	0.99
*** 2012 *** TOTALS (lbs/day,unmitigated)	62.27	295.98	677.94	0.24	11.56	10.54	1.02

62.8 296.96

URBEMIS 2002 For Windows 8.7.0

file Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\greenbriar_buildingconstructi
project Name: Greenbriar Building Construction of Phase 2
project Location: Lower Sacramento Valley Air Basin
n-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2009 *** TOTALS (lbs/day,unmitigated)	42.95	210.88	556.31	0.21	9.71	8.72	0.99
*** 2010 *** TOTALS (lbs/day,unmitigated)	42.43	200.21	557.96	0.21	8.87	7.88	0.99
*** 2011 *** TOTALS (lbs/day,unmitigated)	42.43	200.21	557.96	0.21	8.87	7.88	0.99
*** 2012 *** TOTALS (lbs/day,unmitigated)	62.27	295.88	677.94	0.24	11.56	10.54	1.02

62.8 296.94

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\greenbriar_buildingconstructio
 Project Name: Greenbriar Building Construction of Phase 2
 Project Location: Lower Sacramento Valley Air Basin
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
 (Pounds/Day - Winter)

Construction Start Month and Year: June, 2009
 Construction Duration: 36
 Total Land Use Area to be Developed: 274.27 acres
 Maximum Acreage Disturbed Per Day: 68.57 acres
 Single Family Units: 1197 Multi-Family Units: 280
 Retail/Office/Institutional/Industrial Square Footage: 444310

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2009***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	28.02	192.80	222.78	-	8.13	8.13	0.00
Bldg Const Worker Trips	14.92	18.08	333.53	0.21	1.58	0.59	0.99
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	42.95	210.88	556.31	0.21	9.71	8.72	0.99
Max lbs/day all phases	42.95	210.88	556.31	0.21	9.71	8.72	0.99
*** 2010***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	28.02	182.43	230.35	-	7.29	7.29	0.00
Bldg Const Worker Trips	14.40	17.78	327.62	0.21	1.58	0.59	0.99
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	42.43	200.21	557.96	0.21	8.87	7.88	0.99
Max lbs/day all phases	42.43	200.21	557.96	0.21	8.87	7.88	0.99

*** 2011***

Phase 1 - Demolition Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 3 - Building Construction

Bldg Const Off-Road Diesel	28.02	182.43	230.35	-	7.29	7.29	0.00
Bldg Const Worker Trips	14.40	17.78	327.62	0.21	1.58	0.59	0.99
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	42.43	200.21	557.96	0.21	8.87	7.88	0.99

Max lbs/day all phases 42.43 200.21 557.96 0.21 8.87 7.88 0.99

*** 2012***

Phase 1 - Demolition Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 3 - Building Construction

Bldg Const Off-Road Diesel	28.02	182.43	230.35	-	7.29	7.29	0.00
Bldg Const Worker Trips	14.40	17.78	327.62	0.21	1.58	0.59	0.99
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	4.53	-	-	-	-	-	-
Asphalt Off-Road Diesel	15.21	88.19	129.25	-	2.43	2.43	0.00
Asphalt On-Road Diesel	0.56	8.53	2.06	0.03	0.25	0.23	0.02
Asphalt Worker Trips	0.07	0.03	0.86	0.00	0.02	0.00	0.02
Maximum lbs/day	62.27	295.98	677.94	0.24	11.56	10.54	1.02

Max lbs/day all phases 62.27 295.98 677.94 0.24 11.56 10.54 1.02

62.8 296.84

Phase 2 - Site Grading Assumptions: Phase Turned OFF

Phase 3 - Building Construction Assumptions

Start Month/Year for Phase 3: Jun '09

Phase 3 Duration: 36 months

Start Month/Year for SubPhase Building: Jun '09

SubPhase Building Duration: 36 months

Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
14	Other Equipment	190	0.620	8.0

SubPhase Architectural Coatings Turned OFF

Start Month/Year for SubPhase Asphalt: Apr '12

SubPhase Asphalt Duration: 1.8 months

Acres to be Paved: 68.4

Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
7	Pavers	132	0.590	8.0
7	Rollers	114	0.430	8.0

02/10/2006 2:14 PM

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\greenbriar_buildingconstructor
 Project Name: Greenbriar Building Construction of Phase 2
 Project Location: Lower Sacramento Valley Air Basin
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
 (Pounds/Day - Summer)

Construction Start Month and Year: June, 2009
 Construction Duration: 36
 Total Land Use Area to be Developed: 274.27 acres
 Maximum Acreage Disturbed Per Day: 68.57 acres
 Single Family Units: 1197 Multi-Family Units: 280
 Retail/Office/Institutional/Industrial Square Footage: 444310

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2009***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	28.02	192.80	222.78	-	8.13	8.13	0.00
Bldg Const Worker Trips	14.92	18.08	333.53	0.21	1.58	0.59	0.99
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	42.95	210.88	556.31	0.21	9.71	8.72	0.99
Max lbs/day all phases	42.95	210.88	556.31	0.21	9.71	8.72	0.99
*** 2010***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	28.02	182.43	230.35	-	7.29	7.29	0.00
Bldg Const Worker Trips	14.40	17.78	327.62	0.21	1.58	0.59	0.99
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	42.43	200.21	557.96	0.21	8.87	7.88	0.99
Max lbs/day all phases	42.43	200.21	557.96	0.21	8.87	7.88	0.99

*** 2011***

Phase 1 - Demolition Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 3 - Building Construction

Bldg Const Off-Road Diesel	28.02	182.43	230.35	-	7.29	7.29	0.00
Bldg Const Worker Trips	14.40	17.78	327.62	0.21	1.58	0.59	0.99
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	42.43	200.21	557.96	0.21	8.87	7.88	0.99

Max lbs/day all phases 42.43 200.21 557.96 0.21 8.87 7.88 0.99

*** 2012***

Phase 1 - Demolition Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 2 - Site Grading Emissions

Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase 3 - Building Construction

Bldg Const Off-Road Diesel	28.02	182.43	230.35	-	7.29	7.29	0.00
Bldg Const Worker Trips	14.40	17.78	327.62	0.21	1.58	0.59	0.99
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	4.53	-	-	-	-	-	-
Asphalt Off-Road Diesel	15.21	88.19	129.25	-	2.43	2.43	0.00
Asphalt On-Road Diesel	0.56	8.53	2.06	0.03	0.25	0.23	0.02
Asphalt Worker Trips	0.07	0.03	0.86	0.00	0.02	0.00	0.02
Maximum lbs/day	62.27	295.98	677.94	0.24	11.56	10.54	1.02

Max lbs/day all phases ~~62.27~~ 295.98 677.94 0.24 11.56 10.54 1.02

628294.94

Phase 2 - Site Grading Assumptions: Phase Turned OFF

Phase 3 - Building Construction Assumptions

Start Month/Year for Phase 3: Jun '09
 Phase 3 Duration: 36 months
 Start Month/Year for SubPhase Building: Jun '09
 SubPhase Building Duration: 36 months

No.	Type	Horsepower	Load Factor	Hours/Day
14	Other Equipment	190	0.620	8.0

SubPhase Architectural Coatings Turned OFF
 Start Month/Year for SubPhase Asphalt: Apr '12
 SubPhase Asphalt Duration: 1.8 months

No.	Type	Horsepower	Load Factor	Hours/Day
7	Pavers	132	0.590	8.0
7	Rollers	114	0.430	8.0

02/10/2006 2:14 PM

Construction Emissions Mitigation Fee (draft)

PART 1: PROJECT INFORMATION

Project Name:	Greenbriar		
Control/Application #:			
Single Family Dwelling Units:	2886		
Multi Family Dwelling Units:	587000	Total Residential Acreage:	256
Non-residential Square Feet:	410400	Total Non-residential Acreage:	321

*Non-residential SF includes 288 ksf of community/village commercial and 122.4 ksf school.

*Total non-residential acreage includes non-residential SF and all other uses (e.g., park, buffer, ..) to sum the project size of 577 acres.

PART 2: EMISSIONS INFORMATION

	Activity Phase	NOx (lbs/day) unmitigated	NOx (lbs/day) mitigated*	NOx over threshold (lbs/day)	duration (days)	Total significant NOx (lbs)
	Grading-All of Site prior to construction of Phase 1	638.70	510.96	425.96	145	61849.39
Year 1 of Phase 1	Building Construction-Phase 1	265.66	212.53	127.53	198	25250.54
Year 2 of Phase 1	Building Construction-Phase 1	253.78	203.02	118.02	198	23368.75
Year 3 of Phase 1	Building Construction-Phase 1	241.54	193.23	108.23	198	21429.94
Year 4 of Phase 1	Building Construction-Phase 1	229.64	183.71	98.71	198	19544.98
Year 4 of Phase 1	Asphalt-Phase 1	128.19	102.55	17.55	40	695.06
Year 1 of Phase 2	Building Construction-Phase 2	210.88	168.70	83.70	198	16573.39
Year 2 of Phase 2	Building Construction-Phase 2	200.21	160.17	75.17	198	14883.26
Year 3 of Phase 2	Building Construction-Phase 2	200.21	160.17	75.17	198	14883.26
Year 4 of Phase 2	Building Construction-Phase 2	200.21	160.17	75.17	198	14883.26
Year 7 of Phase 2	Asphalt-Phase 2	96.75	77.40	0	40	0.00
	<i>Total project Nox over threshold (lbs)</i>		213361.84			
	<i>Total project Nox over threshold (tons)</i>		106.68			

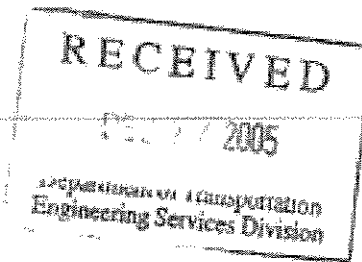
PART 3: MITIGATION FEE RESULTS

	<i>Total Mitigation fee (\$14,300/ton)</i>	\$1,525,537			
	Mitigation Fee (\$/acre)	\$2,643.91			

* assumes a construction mitigation plan which achieves a 20% reduction in NOx

APPENDIX E

GREENBRIAR MASTER AQ/TSM PLAN



December 21, 2005

Ms. Elizabeth Hughes
660 J Street, Suite 444
Sacramento, CA 95814

Subject: GREENBRIAR AQ PLAN

Dear Ms. Hughes:

Thank you for providing this project for review by the Sacramento Metropolitan Air Quality District (District) staff. District staff comments follow.

The provisions of the air quality plan meet the expectations of District staff. As a smart growth project located along the proposed Downtown Natomas Airport (DNA) Light Rail Line, many of the goals for a responsive air quality plan are met by the design and strategic location of the project. Since the DNA Line does not yet exist, the greatest air quality impacts will be realized once that RT project is completed.

In staff comments to the project proponents we highlighted the recent guidance provided by the California Air Resources Board regarding the potential hazards of projects located near freeways. In that guidance ARB noted that there are possible toxic hazards for sensitive receptors residing near major freeways. Lacking specific details for what those hazards will be, District staff met with representatives of Greenbriar to discuss possible mitigation measures. At that meeting, Greenbriar proponents agreed to plant trees and other physical/natural barriers between the few homes that would be impacted and the I-5 freeway. They further agreed to place the latest technology in windows design. If the District receives further guidance from ARB, we will send it to you.

If you have questions, please contact Jean Borkenhagen at 874-4885 or jborkenhagen@airquality.org as I will be retiring from the District effective January 6, 2006. It has been my privilege to work with you on this project and many others during my tenure at the District.

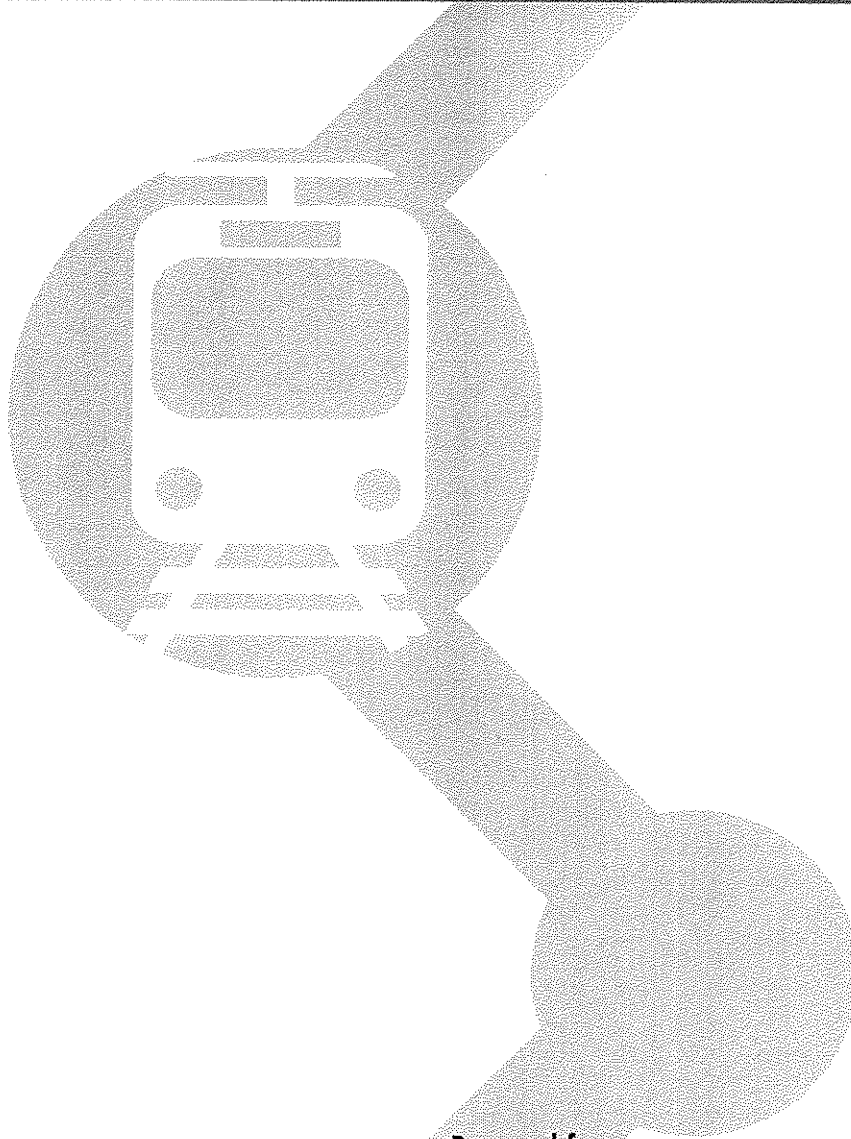
Sincerely,

Art Smith, Associate Air Quality Planner Analyst

cc: Ed Cox, City of Sacramento, Ron Maertz, SMAQMD

LMSO/Land Use & Transportation/Land Use/SAC900400004 AQ Plan

GREENBRIAR MASTER AQ/TSM PLAN



Prepared for:
North Natomas 575 Investors, LLC

CITY OF SACRAMENTO &
SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

 THE HOYT COMPANY October 5, 2005

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1.0 PROJECT DESCRIPTION (#29 - 1.0%, #26 - 1.5%, #31 - 0.5%)

North Natomas 575 Investors, LLC proposes to develop Greenbriar, a 577-acre mixed use transit oriented development in the North Natomas community. Greenbriar consists of low, medium and high density housing. Increased density directly relates to improved air quality. The higher the density, the more likely one is to meet a neighbor to form a carpool or walking/bicycling group, or to take transit. Greenbriar has a diversity of housing with 12 different proposed housing types. The overall average residential density of 12 dwelling units per acre.

The Greenbriar community will serve as a focal point with 9 parks, an elementary school, retail and commercial uses. A pedestrian paseo surrounds an extensive water feature that runs through the project. The project is a true suburban infill TOD in keeping with the SACOG Blueprint project. Unique for a suburban development, the project has been strategically designed around a future light rail station on the DNA line. This light rail line will connect the Natomas area to jobs at Metro Air Park, the Sacramento International Airport, and key activity centers in Natomas such as Arco Arena and the Town Center area, as well as downtown Sacramento.

Greenbriar is bound by I-5 to the south, Highway 99 to the east, and Elkhorn Boulevard to the north and Lone Tree Road to the west. Metro Air Park, a master planned commercial and industrial development with an estimated 35,000 jobs at build out, lies immediately to the west of Greenbriar.

A schematic plan for the project is located on page 2.

The Smart Growth design of Greenbriar supports the air quality and trip reduction goals described in the North Natomas Community Plan¹ and those of the City of Sacramento.

¹ *North Natomas Community Plan*, May 1994.

2.0 BACKGROUND ON SACRAMENTO AIR QUALITY

Ground-level ozone, a primary ingredient in smog, is formed when volatile organic compounds (VOCs) and NO_x react chemically in the presence of sunlight. Cars, trucks, power plants and industrial facilities are primary sources of these emissions. Ozone pollution is a concern during the summer months when weather conditions are suitable for the formation of ground-level ozone. Ozone also aggravates asthma, damages the lining of the lungs and makes breathing more difficult.

Sacramento has been designated as a nonattainment area for ozone pollution. The region is not in compliance with standards set forth in either the Federal or State Clean Air Acts (does not meet the 8-hour ozone standard: 0.08 parts per million (ppm), averaged over eight hours). Sacramento must meet the federally mandated deadlines established by the 1990 Amendment to the Clean Air Act to be compliant with the national ambient air quality standards. In the interim, the nonattainment area must demonstrate to the EPA that they are making reasonable progress toward improving their air quality. The deadline for meeting the 8-hour ozone standard for Sacramento is 2013. Federal monies received for roadways and other transportation improvements may be reduced significantly if attainment is not met.

In order to meet the requirements of the Clean Air Act, most 8-hour ozone nonattainment areas will be required to submit a state implementation plan to the EPA by April 2007. Through this plan, states will design their approach to reducing the ozone level in the air and emissions of ozone precursors. Working with the EPA, nonattainment areas will also implement programs to further reduce emissions of ozone precursors from sources such as cars, fuels, and consumer/commercial products and activities.²

3.0 INTRODUCTION TO TRANSPORTATION MANAGEMENT

Transportation management is a combination of services, incentives, facilities, and actions that reduce single occupancy vehicle (SOV) trips to help relieve traffic congestion and air pollution especially during peak periods. Transportation management also encourages more efficient use of alternative transportation systems.

The basic premise of transportation management is the maximum utilization of existing transportation resources. The Sacramento region, as is typical of urban areas in the United States, has billions of dollars invested in roadway infrastructure and hundreds of millions of dollars invested in public transit infrastructure. The goal of transportation management is to more efficiently and economically take advantage of these major capital investments.

² U.S. Environmental Protection Agency, 2005, www.epa.gov/ozonedesignations
Sacramento Metropolitan Area Management District, 2005, www.airquality.org/news.html#8hourdesignation.

The four basic goals that can be achieved through effective utilization of transportation management measures are:

1. Converting SOV trips to an alternative mode of transportation (i.e., transit, carpools, vanpools, bicycles or walking)
2. Reducing air pollution (i.e. technological solutions such as high-efficiency HVAC systems)
3. Reducing energy consumption (i.e., purchasing less gasoline)
4. Eliminating trips (i.e., telecommuting)

The concept is very similar to what private industry has done for decades. Private businesses have always managed their assets to produce the maximum output of a fixed capital investment. For example, if an automobile manufacturer experiences more demand for their product than can be produced at an existing plant, they do not build another expensive plant, they add a second and eventually a third shift. The manufacturer utilizes its existing resources (capital investment in machinery) over a longer period of time (asset management).

Until recently in the United States, the answer to relieving congestion on roads and in parking structures has been to build more roads and parking structures (similar to building another automobile manufacturing plant). Current economics, limited resources, and the need to reduce air pollution affect the ability to build and maintain more roads or parking structures. This reality necessitates better utilization of the existing transportation infrastructure (similar to adding a second shift). Transportation management measures support this transition to a greater use of existing alternative transportation options.

Transportation management can be the solution, or at least one element of the solution, to three basic concerns:

1. Air pollution
2. Traffic congestion
3. Energy consumption

The Sacramento Metropolitan area, as a growing urban area, needs to address all three of these concerns. The Greenbriar project has the opportunity to be part of the solution through the transportation management programs identified in this plan.

4.0 AQ/TSM PLAN GOAL

To reduce air quality pollution and traffic resulting from development in North Natomas, the City of Sacramento and the Sacramento Metropolitan Air Quality Management District (SMAQMD) require new development in North Natomas to mitigate air pollution and automobile trips. The City of Sacramento and the SMAQMD have developed a listing of different Air Quality Mitigation Measures and Transportation Systems Management (TSM) measures that, when incorporated into new development, will reduce air pollutants and automobile trips.

The City of Sacramento and North Natomas Community Plan require an AQ/TSM Plan for major projects:

The property owner of every Major Project shall be required to obtain a Transportation Management Plan (TSM Plan) permit subject to approval by the Planning Director and the Traffic Engineer.... Major Project defined as...any development proposal which is expected to be the primary place of business of 100 or more employees.³

Each non-residential project shall comply with the Citywide Transportation Management (TSM) ordinance and a Transportation Management Plan shall be required.⁴

Separate specific AQ/TSM Plans for SC and C-2 uses will be created and submitted as the project develops. The plan will follow the guidelines set forth in this Master Plan.

The following sections provide details of the mitigation measures included in the Greenbriar development which support the required 35% mitigation for commercial land uses and 15% for residential land uses. Specifics for commercial development regarding actual number of required carpool spaces, bicycle storage spaces, etc. will be provided in a subsequent AQ/TSM Plan.

Sacramento has the 7th worst air quality in the nation. However, our region's air quality is improving in part from compliance of these requirements by projects, such as Greenbriar. Implementation of TSM and air pollution reducing strategies will continue to be an important component of cleaning up the air for a healthier economy and lifestyle.

Section 17.184.060 of the City of Sacramento zoning code states that the plan obligations shall either be included in the covenants, conditions, and restrictions prepared for the development and recorded as part of that document, or separately recorded. The filing fee for this permit shall be in an amount specified by resolution of the city council. At any time after the original plan has been approved, the property owner may request modification of the plan by filing an application and processing fee in the amount specified by resolution of the city council. (Ord. 99-015 § 6-1-F)

³ City of Sacramento Zoning Ordinance.

⁴ *North Natomas Community Plan*, May 1994, Pg. 47.

5.0 TMA MEMBERSHIP (#51 - 2.5%)

Transportation Management Associations (TMA)s are private, nonprofit organizations run by a voluntary board of directors with typically a small staff. They help businesses, residents, developers, building owners, local government representatives, and others to work together to collectively establish policies, programs and services to address local transportation problems. The key to TMAs lies in the synergism of multiple groups banding together to address and accomplish more than any employer, resident, building operator or developer could do alone.

Currently Greenbriar is not served by a TMA. The TMA closest to Greenbriar is the North Natomas Transportation Management Association (NNTMA). The NNTMA offers its employee and residential members services such as shuttle service, Guaranteed Ride Home Program, transportation fairs, ridematching assistance, and vanpool assistance. Membership fees are automatically paid by residents and tenants through annual assessments to the Community Facilities District.

The NNTMA also provides the following programs:

Bicycle Incentive - The NNTMA has a program geared towards increasing bicycle usage. They offer rebates toward the purchase of a new bicycle.

Save Money and Air by Reducing Trips (SMART) - Transportation options and information will be provided to those who join the SMART club. Prizes are offered as incentives to keeping informed.

School Program - The NNTMA can help set up an all-volunteer "Walk-to-School" program at the elementary school within Greenbriar. This program provides students an organized, safe and healthy option for their trip to school.

Greenbriar will join a TMA and participate in programs and services offered by the TMA. Greenbriar's Transportation Coordinator (see Section 6.0) will work with the TMA to promote TMA programs for the purpose of reducing employee commute trips. The TMA will also promote programs to residents through marketing, transportation fairs, and through their Web site and publications.

The TMA will also work with the Transportation Coordinator to provide information to new residents.

5.1 Vanpool Assistance Program

Greenbriar's TC will work directly with the TMA and residents, with the purpose of forming vanpools. Typically, vanpools are created and used by employees who live 25 miles or more from their worksite. The North Natomas TMA has found that targeting employees who live closer to their worksites has been successful in the formation of vanpools.

6.0 TRANSPORTATION COORDINATOR (#57 - 0.2%)

Greenbriar will provide a Transportation Coordinator (TC) who will have the primary responsibility for implementing the measures found in this Master Plan.

This position will be temporarily filled by:

Name: Ms. Elizabeth Hughes, The Hoyt Company
Address: 660 J Street, Suite 444
Sacramento, CA 95814
Phone: (916) 448-2440
Email: elizabeth@thehoytco.com

If land is sold, the new property owner(s) will provide a TC. The land owner will inform the City with the name(s) of the TC(s). The TC will provide the following services and functions in coordination with the TMA:

1. Implement programs found in the Master AQ/TSM Plan for Greenbriar.
2. Develop and maintain liaison with the TMA serving Greenbriar.
3. Coordinate and manage various aspects of the Master Plan that require periodic updates or monitoring such as Guaranteed Ride Home Program registration, carpool registration, parking assignment and enforcement, locker assignment and enforcement.
4. Coordinate the transportation needs of the project specifically related to alternative modes of transportation such as shuttles or vanpooling.
5. Provide information and resource materials on the full range of transportation choices available (update the kiosk/centers of information).
 - Transit information (when RT implements and modifies service)
 - Bicycle information such as bicycle maps, new routes, etc. (available from Sacramento Area Council of Governments (SACOG), the TMA, and Sacramento Area Bicycle Advocates)
 - Carpooling/vanpooling information
6. The TC will be responsible for informational items provided at the sales/rental office for potential home buyers/lessors to review. A display will contain transit schedules, maps, bicycle and rideshare information, and the new resident transportation flyer. In addition, the TC will give each new homeowner/lesor a packet containing these materials at the close of escrow/lease signing. The TC will

update the information at least once per year until the project has been sold out. The TC will also work with the rental office(s) to keep an updated display in the common areas of the apartment complex(es)/senior living area

7. Develop relationship with tenant employees by on-site visits, transportation fairs and emails; promoting TSM and AQ programs.
8. Conduct an annual survey of tenant employee commute methods for the entire development and distribute summarized results to the tenant and to the City of Sacramento Department of Planning Department and the SMAQMD as part of the annual report process. (Please refer to Section 16.0 Expiration of Plan, page 18.)
9. Evaluate survey results for alternative transportation use and potential.
10. Promote telecommuting (working from home, which eliminates trips) and flextime (work schedules are flexible to accommodate carpooling or taking transit) where appropriate.

The TC will coordinate with TMA staff for program implementation such as the Guaranteed Ride Home Program and for information dissemination such as current bicycle maps, shuttle schedules, promotional incentives, and when appropriate, RT schedules. The TC must be provided with this Master AQ/TSM Plan so that the TC will know what the responsibilities are for this project. If there are any TC training opportunities provided by the TMA or other local agency, the TC must attend. The TC will also coordinate with the TMA staff to occasionally attend TMA board meetings or other regional meetings having to do with TSM or air quality.

If the person performing the duties of the TC changes, the City of Sacramento Transportation Department must be informed.

References to various air quality agencies are attached and are provided for benefit of the TC.

7.0 INFORMATION KIOSK (#8 - 0.5%)

Prior to occupancy, all tenants and residents will have available to them information that promotes improved air quality. The leasing/sales office will display information such as shuttle information, transit schedules (when appropriate), regional ridesharing programs, bicycle commuting programs, and other TMA or SMAQMD programs.

A permanent display will be provided in an employee common area with pertinent alternative mode information (see example on following page). Two outdoor kiosks will also be provided for the benefit of visitors to Greenbriar. The information will be updated as necessary (at a minimum annually) by the TC. This information will also be

distributed to employees when they are newly hired. The following are the types of information that will be provided:

- Maps and schedules for shuttles, Regional Transit bus routes and light rail, and transit pass subsidy program (when appropriate);
- Regional ridesharing programs (i.e., Rideshare Week, SACOG Rideshare's 511 rideshare matching program)
- Bicycle commuting programs (i.e., SACOG Rideshare's bicycle buddy matching, Bike to Work Day)
- Sacramento Metropolitan Air Quality Management District and TMA programs (i.e., GRH Program, Spare the Air)
- Commute alternative allowance program
- TC contact information

8.0 BICYCLE/PEDESTRIAN IMPROVEMENTS

8.1 Project Located Within 1/2 Mile of Class I or Class II Bikeway (#5 - 1.0%)

Bicycle lanes are planned throughout Greenbriar and along Elkhorn Boulevard. Five foot (5') to six foot (6') bicycle lanes are designed to connect residents to all uses including the school and parks. Please refer to page 2 to view the project's street sections.

Please refer to the bikeways map on page 11 to view the project in relation to the City's planned and existing bikeways.

Through bicycle commuting assistance offered by SACOG Rideshare, Greenbriar can provide safety and bicycle matching information to residents and employees who bicycle to work or for recreation.

8.2 Pedestrian Pathways (#6 - 1.0%)

Five foot (5') sidewalks will be constructed throughout Greenbriar. All sidewalks (with the exception of a portion of Meister Way, will have additional "buffer" landscaping to separate pedestrians from the roadways. Please refer to page 2 to view the project's street sections for exact dimensions.

8.3 Separate Bicycle/Pedestrian Path (#32 - 2.0%)

A fifteen foot (15') pedestrian paseo is designed to surround the water feature. The paseo will feature landscaping, lighting and benches. The paseo will also serve as a connector to the different uses within Greenbriar including the school and parks.

In addition to the fifteen foot paseo, land for a 100 ft. buffer will be dedicated to the City of Sacramento for construction along the freeway and the project property line. The buffer area will be landscaped and will make possible for a future twelve foot (12') off-street bikeway.

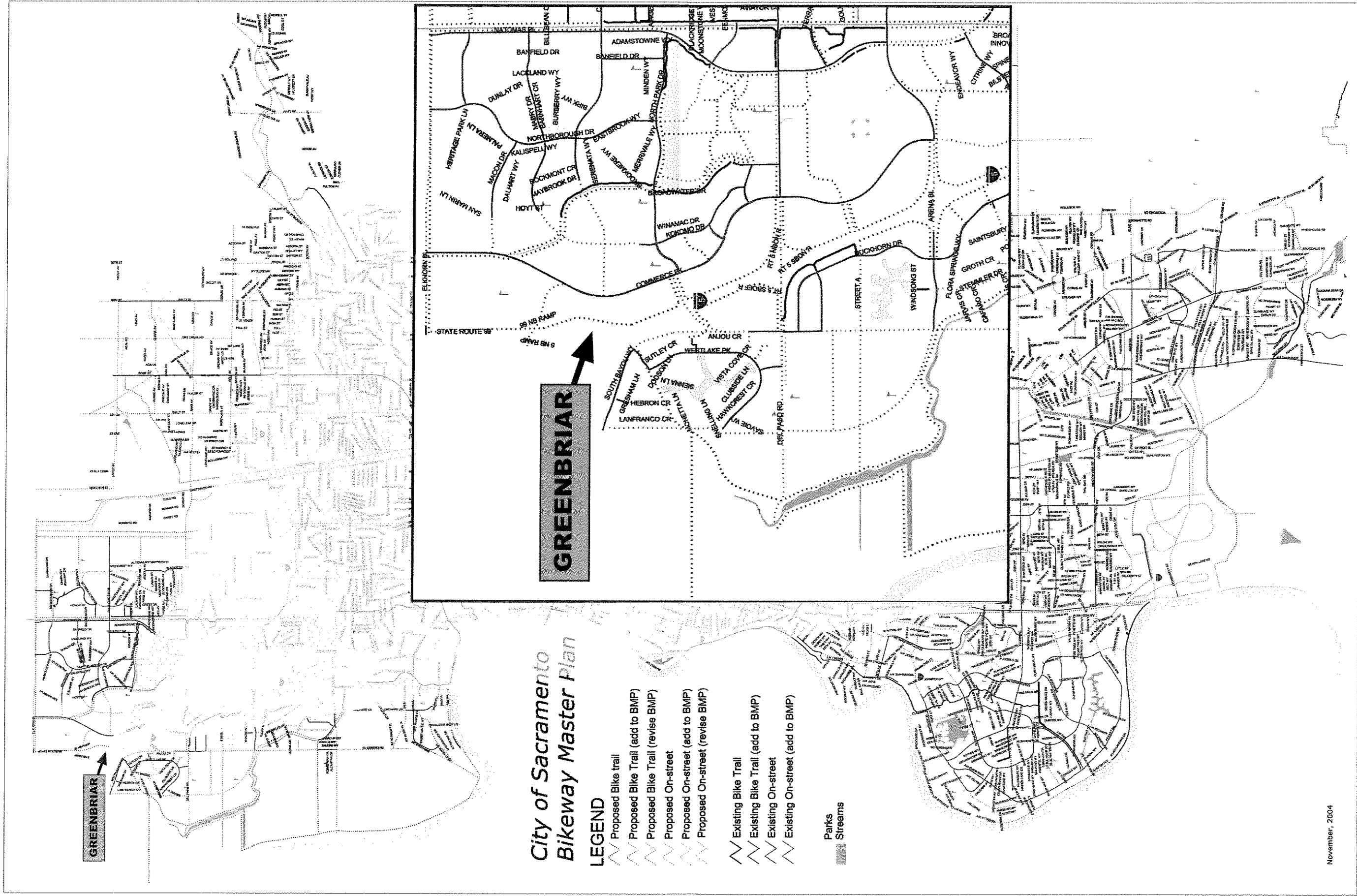
8.4 Eliminates Residential Uses that Impede Bicycle/Pedestrian Circulation (#33 - 1.0%)

This project will be designed to maximize bicycle and pedestrian connectivity between residential uses and commercial/retail land uses. Any uses that may impede pedestrian or bicycle circulation, such as berms, gates, walls, or other structures will not be constructed.

8.5 Bicycle Storage (1.0%)

Having a secure place to store bicycles is a concern for those who would like to bicycle to work. Class I lockers, fully enclosed and locked units, provide the optimum storage for bicycles. In a locker a bicycle is completely protected from the elements and theft. Class II racks are those that one would chain a bicycle to and are usually in front of building entrances. Frame locking racks are convenient and deter from theft.

Greenbriar will provide Class I and Class II bicycle parking throughout the commercial area of the project at a ratio one (1) bicycle storage space for every 20 required parking spaces. Fifty Percent (50%) of the storage spaces will be Class I with the remaining spaces Class II (frame locking style).



9.0 TRANSIT (#10 - 0.5%, #29 - 1.0, 5.0%, 5.0%)

Greenbriar is a transit oriented **mixed-use** project with high-density uses within 1/4 mile of planned transit. Greenbriar has **dedicated land** along Meister Way for the purposes of a light rail station. Additional land has been reserved for a Regional Transit sub-station as well as a **park-n-ride lot**. The lot will include spaces for cars as well as Class I lockers for bicyclists.

The Greenbriar development plan embodies several planning strategies aimed at optimizing the potential for transit ridership when the planned RT Light Rail line from downtown to the Sacramento International Airport is built and a station is established at the center of Greenbriar:

- Higher density housing near the station site
- Mixed-use development adjacent to the station site
- Residential block sizes that encourage pedestrian and bicycle activity
- Open space/park network for easier pedestrian/bicycle trips

Initially Greenbriar will not be directly served by public transit, as the community is in the initial stages of infrastructure development. However, the NNTMA does provide shuttle services that will serve this project as it builds out (see Section 9.1). As the new residents begin to occupy homes and as commercial areas develop in North Natomas, residents and employees will be served by increased bus service and ultimately, light rail provided by Regional Transit.

9.1 Shuttle Service (10.0%)

Because transit service is not readily available, the NNTMA has developed a shuttle program that serves the residents in the North Natomas community.

Shuttle service will adjust as development occurs; however, current service provides residents in North Natomas with three types of service: commuter, shopper, and dial-a-ride. The following information details shuttle service.⁵

Commuter Subscription

Operates from 5:30 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m., Monday through Friday. Provides service for North Natomas residents to workplaces and transportation connections in North Natomas, South Natomas business corridor and downtown Sacramento. Currently commuter service is free and seats are filled on a first come first serve basis. The NNTMA is anticipating an expansion in this service and a cost of \$1 per ride.

⁵ NNTMA Web site, <http://www.northnatomastma.org>, 2005.

Dial-A-Ride

This service is for the occasional rider. \$1 each way; free to destinations in North Natomas. Residents will need to call the shuttle line at (916) 429-2667 to schedule a ride (reservations accepted between 9:30 a.m. and 2:30 p.m.). Limited to space available.

Shopper's Shuttle

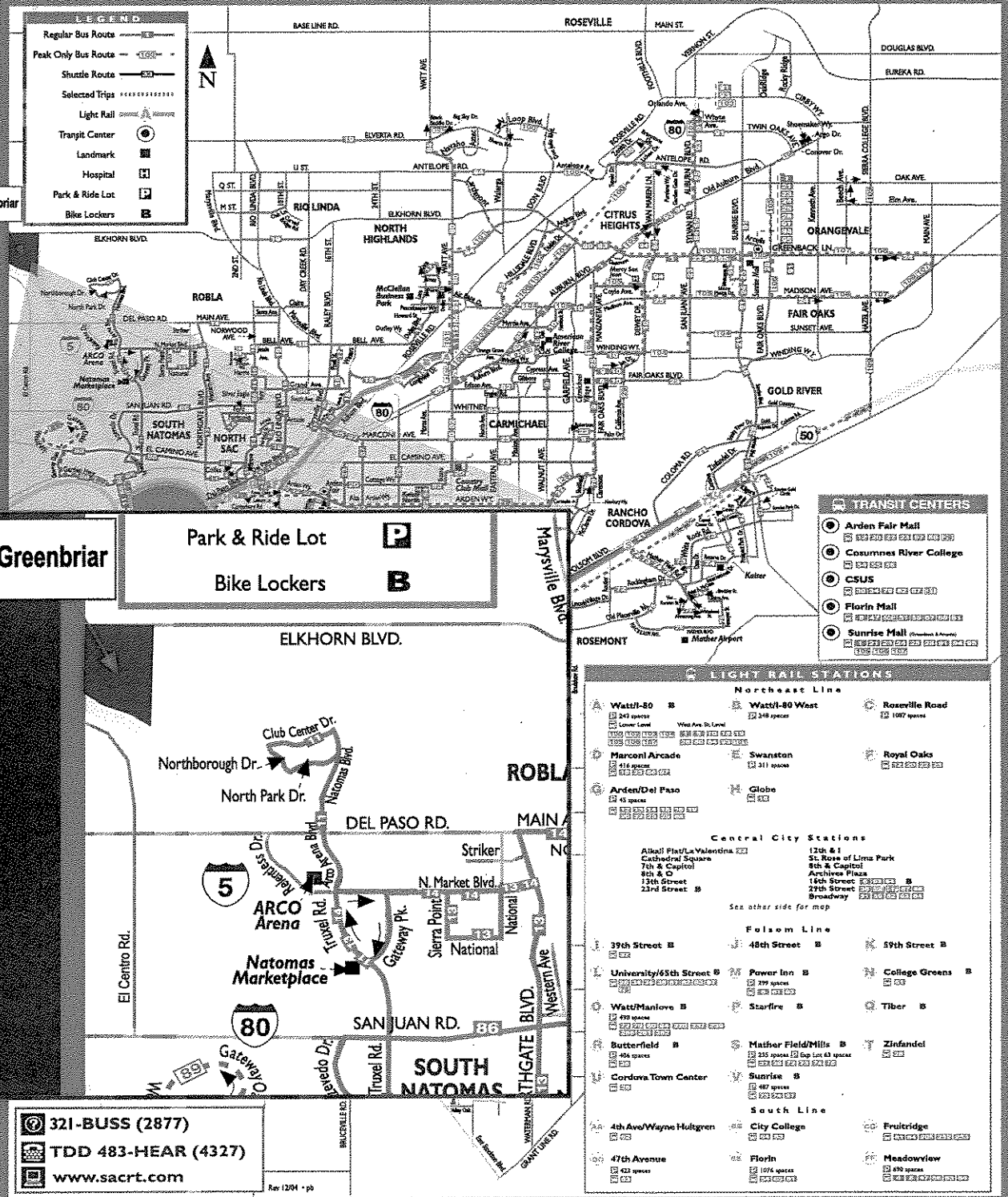
Operates from 10:00 a.m. to 4:00 p.m., Monday through Friday. Provides shuttle service on a fixed route to shopping and recreational facilities within the North Natomas community. Free to all users.

All service will be provided by shuttle bus or by taxicab. Residents will be notified what vehicle to expect when they schedule their rides.

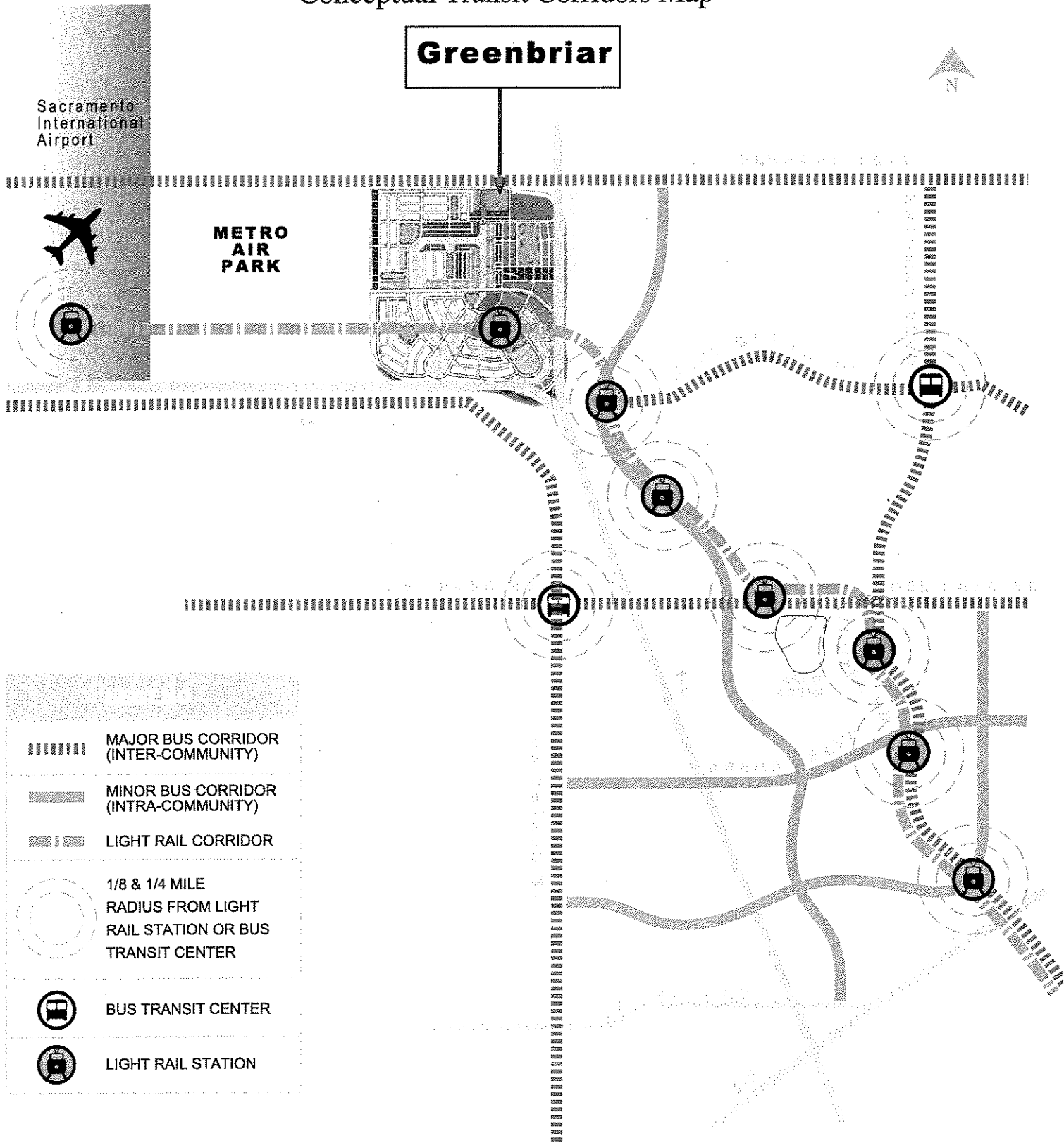
Greenbriar is aware that until RT transit service is readily available, shuttle service is an important component in their alternative mode program. Greenbriar will provide their community with shuttle service that will include a commuter line as well as other midday service. Greenbriar is currently in negotiations including the NNTMA to procure this kind of service.

BUS & LIGHT RAIL SYSTEM MAP

EFFECTIVE JUNE 19, 2005



Conceptual Transit Corridors Map



10.0 PREFERENTIAL PARKING FOR CARPOOLS/VANPOOLS (5.0%)

As an incentive to rideshare, one effective measure is to reserve the most preferred parking spaces for exclusive use by carpools. Preferential parking not only provides the direct benefit of convenience to employees, but also provides a certain degree of prestige as reserved, prime parking spaces are normally only given to upper management.

Ten percent (10%) of all employee parking spaces at Greenbriar's commercial areas will be reserved for carpools (exact numbers and locations will be provided in a subsequent AQ/TSM Plan). These spaces will be located as close to the building entrances as possible to provide maximum benefit and convenience to those who use an alternative mode of transportation.

The TC will promote carpooling and spaces, if necessary, and be responsible for assigning the spaces.

11.0 PARKING (#12 - 0.5%)

The amount of parking provided at a site is directly related to the amount of alternative mode use. If there is an abundance of parking it makes it easier to drive to work. However, limiting the amount of parking provides an incentive to carpool, bicycle, or walk to work.

Greenbriar will provide the minimum amount of parking spaces required by the City of Sacramento (1 space/400 s.f. for EC; 1 space/250 s.f. for HC; and 1.5 spaces/d.u. + 1 space/15 d.u. for HD).

11.1 Parking Lot Shading (#15 - 0.5%)

The City of Sacramento requires that a certain percentage of a development's parking lot be shaded by 50% within 15 years of the establishment of the parking lot. To improve air quality conditions, Greenbriar will provide an additional 10% of parking lot shading by adding more trees.

12.0 GUARANTEED RIDE HOME (2.0%)

All employees or residents who commute to work using transit or in a carpool or vanpool will be guaranteed a ride home in the case of a personal emergency or when they unexpectedly have to work late, thereby missing the last bus or their normal carpool home.

The program will be provided by the TMA and be available to employees and residents of the project as a membership benefit. This program has proven very successful elsewhere in California. It removes one of the major objections employees have to giving up their private automobiles (i.e., not being able to get home in case of an emergency), especially for those with young families.

13.0 PERSONAL MATCHING ASSISTANCE (2.0%)

Forming carpools is an important step in reducing the number of commute trips into and out of the Sacramento area. Carpools help reduce traffic congestion on surface streets and, typically, reduce commute time (especially on freeways with High Occupancy Vehicle lanes - carpool lanes). The Personal Matching Assistance (PMA) program will provide assistance to employees wishing to carpool.

SACOG has partnered with the California Department of Transportation (Caltrans) to launch a 511 transportation information system for the six-county Sacramento region that will assist in the formation of carpools.

The 511 telephone number is accompanied by a Web site, www.sacregion511.org. The number and Web site will give commuters the information they need to make better choices when planning trips. By calling in or logging on, commuters can get up-to-the-minute information about traffic conditions, public transportation options, ridesharing, and bicycling anytime, anywhere throughout the Greater Sacramento area and Northern California.

The six-county Sacramento system will be the second 511 service to go on-line in California. It will provide links to 511 systems in the Bay Area, Oregon and Nevada and will be available from any phone, provided the carrier supports 511. Most counties in the region will have wireless and landline access to the service through the major carriers.

Residents and employees will be provided with information on this program, and, if necessary, personal assistance from the TC in order to register their commute information or to find/form carpools with employees within Greenbriar. The TC will work with the TMA to promote this program and to utilize their assistance if required.

14.0 LANDSCAPING (#58 - 2.0%)

Most small-engine landscape maintenance equipment is very 'dirty' in air quality terms. These small internal combustion engines often have very high pollutant emissions. Since landscaping companies use the equipment almost continuously throughout a workday, the cumulative impacts of these machines becomes a moderate source of air pollutants in the Sacramento Valley.

The project proponent will contract with commercial landscapers who use either 50% electric or low-emission equipment certified by the California Air Resources Board (CARB).

Contractors will provide documentation (a one-page letter) confirming use of new equipment. The letter will include date of purchase and kind of equipment used. This letter will then be forwarded to the City's Planning Department and the SMAQMD.

15.0 FURNACE (#42 - 0.5%)

Natural gas burners, used in furnaces, are the primary energy source for manufacturing, industrial processing and space heating, and commercial and residential space heating and hot water. U.S. homes, businesses, industry, and power generators burned nearly 23 trillion cubic feet of natural gas in 2000, generating 22.6 quadrillion British Thermal Units (BTUs) of energy and emitting nearly 22 million metric tons of NO_x.⁶

In an effort to reduce NO_x pollution, Greenbriar will be installing the lowest emitting commercially available furnaces in their buildings.

16.0 EXPIRATION OF PLAN

All measures in this Master Plan shall continue to be implemented by the applicant. Informational promotions, such as displaying flyers or transit schedules at the information kiosk, will continue to be provided and updated as necessary. Updated information may be obtained by the Executive Director of the TMA, SACOG, the SMAQMD, and/or any other relevant agency.

Periodic monitoring will be conducted by the City of Sacramento by telephone or by on-site visits, to ensure that measures in this Master Plan are being implemented.

Annual Report

Each year an annual report will be carried out by the TC as follows:

1. Conduct a survey representing all employees within the Greenbriar project. The survey must determine the employee commute mode split (how employees are getting to and from work).
2. Collect data and summarize the results including progress toward attainment of the alternative commute mode goal of the city. If alternative commute mode goal has not been attained, a plan for additional TSM measures shall be implemented.

⁶ Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory, 2003.

3. The TSM Plan Annual Report Summary will be forwarded to the City of Sacramento, Transportation Department and the SMAQMD for review and processing at the one year occupancy anniversary and thereafter annually.

Failure to comply with reporting is a violation and shall be enforced pursuant to Section 18.12.060 of the Zoning Ordinance.

17.0 CONCLUSION

The Greenbriar proposed transit oriented mixed-use development is consistent with the emission reduction goals contained in the North Natomas Community Plan and trip reduction goals of the City of Sacramento. For a suburban development, it is unusual in terms of its higher density and pedestrian/bicycle/transit oriented design. This Plan is designed to improve air quality and traffic through emission and trip reducing mitigation measures.

As future commercial projects are developed, specifics regarding actual number of parking spaces, bicycle storage facilities, and preferential parking spaces, etc., will be provided through subsequent AQ/TSM Plans.

Please see the following pages for the required forms that summarize the proposed measures contained in this Plan: Compliance, Project Profile, and City of Sacramento. Also attached is a listing of air quality contacts, sample survey questions and an example of a kiosk of information.

COMPLIANCE FORM

**AIR QUALITY PLAN COMPLIANCE FORM
GREENBRIAR**

A total of 35% trip reduction and 15% air pollution reduction is required for this project.

A. TSM Measures	Credit
Preferential parking	5.0%
Land dedication for transit	5.0%
Bicycle storage	1.0%
Community Shuttle	10.0%
PMA	2.0%
GRH	2.0%
Vanpool assistance program	5.0%
Park-n-ride lot	5.0%
Subtotal	35.0%

B. Air Quality Mitigation Measures	Credit
5 Located within 1/2 mile of existing Class I or Class II bike lane	1.0%
6 Provides pedestrian improvements	1.0%
8 Provide a display case/kiosk displaying transportation information	0.5%
10 Residential use within 1/4 mile of planned transit	0.5%
12 Minimum amount of parking	0.5%
15 Increase parking lot shading by 10%	0.5%
26 Average residential density 7 d.u. per acre or greater	1.5%
29 Mixed use	1.0%
31 Neighborhood serves as focal point	0.5%
32 Separate & safe bicycle & pedestrian paths connecting residential, commercial & office uses	2.0%
33 Provide development pattern that eliminates physical barriers that impede ped./bike activity	1.0%
42 Install low emitting furnaces	0.5%
51 Permanent TMA membership	2.5%
57 Transportation Coordinator	0.2%
58 Contract with landscapers complying w/CARB standards	2.0%
Subtotal	15.2%

Greenbriar
Project Name

Applicant Name

Applicant Signature

Approved By:

City of Sacramento Transportation Department

City of Sacramento Planning Department

ATTACHMENT

**AIR QUALITY INFORMATION
CONTACTS**

INFORMATION CONTACTS

American Lung Association Sacramento Emigrant Trails chapter

909 12th Street
Sacramento, California 95814
Phone: (916) 444-5864 (LUNG) or (800) LUNG-USA
Fax: (916) 444-6661
Email: staff@alaset.org
Website: <http://www.alaset.org>

North Natomas Transportation Management Association (TMA)

Mr. Bill Fairbairn
2101 Arena Boulevard, Suite 200
Sacramento, CA 95834
Phone: (916) 808-7735 ext. 4
Website: <http://www.northnatomastma.org>

California Air Resource Board (CARB)

1001 I Street
Sacramento, California 95814
Phone: (916) 322-2990
Website: <http://www.arb.ca.gov>

Sacramento Regional Transit District (RT)

P.O. Box 2110
Sacramento, California 95812-2110
Customer Relations Phone: (916) 321-2850 or (916) 321-2877 (BUSS)
Customer Relations Fax: (916) 444-0502
Website: <http://www.sacrt.com>

Sacramento Area Council of Government (SACOG)

1415 L Street, Suite 300
Sacramento, California 95816-7056
Phone: (916) 321-9000
Fax: (916) 321-9551
Website: <http://www.sacog.org>

Sacramento Metropolitan Air Quality Management District (SMAQMD)

777 12th Street, 3rd Floor
Sacramento, California 95814
Community Education Phone: (916) 874-4888
Community Education Fax: (916) 874-4899
Website: <http://www.airquality.org>

SURVEY QUESTIONS



Please complete the following questionnaire. Your company is developing a transportation program for employees and the information you provide will help determine the facilities and services that would be most valuable to you. All of your answers are strictly confidential.

1. Based on the definitions at the right, how did you get to work today?
(Check only one space)

- | | |
|------------------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> Drove alone | <input type="checkbox"/> Transit |
| <input type="checkbox"/> Carpool driver | <input type="checkbox"/> Carpool passenger |
| <input type="checkbox"/> Vanpool driver | <input type="checkbox"/> Vanpool passenger |
| <input type="checkbox"/> Walked | <input type="checkbox"/> Bicycled |
| <input type="checkbox"/> Buspool driver | <input type="checkbox"/> Buspool passenger |
| <input type="checkbox"/> Telecommuted/Worked at home | <input type="checkbox"/> Other _____ |

2. Counting the trip to work as one trip and the trip home as a second trip, how many commute trips do you make Monday through Friday?
_____ trips per week

3. Of the weekly trips noted in Question 2, how many are by:
 _____Carpool _____Vanpool _____Buspool
 _____Transit _____Bicycle _____Walking
 _____Telecommuting*

* Indicate the number of trips you did not take because you used this option

4. Do you normally come to work either between the hours of 6:00 a.m. and 9:00 a.m. or between 3:30 p.m. and 6:30 p.m.? Yes No

5. Do you normally go home from work either between the hours of 3:30 p.m. and 6:30 p.m. or between 6:00 p.m. and 9:00 a.m.? Yes No

6. How far from work do you live (one way only)?
(Check one box only)

- | | | |
|--------------------------------------------|--------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> 0 - 0.9 miles | <input type="checkbox"/> 1.0 - 2.9 miles | <input type="checkbox"/> 3.0 - 5.0 miles |
| <input type="checkbox"/> 5.1 - 9.9 miles | <input type="checkbox"/> 10.0 - 14.9 miles | <input type="checkbox"/> 15.0 - 19.9 miles |
| <input type="checkbox"/> 20.0 - 24.9 miles | <input type="checkbox"/> 25 or more miles | |

7. If you drive a car or motorcycle: a) Where do you normally park?
(Check the most appropriate box)

- | |
|----------------------------------------------------------------------------------------|
| <input type="checkbox"/> In the company (including county, state, or federal) lot. |
| <input type="checkbox"/> On the street: <input type="checkbox"/> 10 hour parking meter |
| <input type="checkbox"/> 2 hour parking meter |
| <input type="checkbox"/> No time restrictions |
| <input type="checkbox"/> Permits required |
| <input type="checkbox"/> In a lot with company provided space. |
| <input type="checkbox"/> In a public or private lot open to everyone. |
| <input type="checkbox"/> In a vacant field. |
| <input type="checkbox"/> Other: specify _____ |

DEFINITIONS

Driving alone:

Driving your car or motorcycle to work without a passenger.

Carpooling:

Riding or driving to work in a car carrying at least one passenger. This includes being dropped off if the driver goes to work at another site.

Vanpooling:

Riding or driving to work with 6 or more passengers in the same vehicle.

Transit:

Riding a bus or using light rail to get to work.

Buspooling:

Riding a bus that does not return home until the end of a work day.

Bicycling:

Riding a non-motorized bicycle to work.

Walking:

Traveling from home to work on foot (walking from a transit stop or a parking lot does not count).

Telecommuting:

Working at home or at a satellite office instead of at your employer's normal worksite.

b) How much do you pay for parking each month?
(Check the appropriate box)

- | |
|------------------------------------------------|
| <input type="checkbox"/> Nothing: Free Parking |
| <input type="checkbox"/> Employer pays |
| <input type="checkbox"/> \$1 - 20 |
| <input type="checkbox"/> \$21 - 40 |
| <input type="checkbox"/> \$41 - 60 |
| <input type="checkbox"/> \$61 - 80 |
| <input type="checkbox"/> \$81 - 100 |
| <input type="checkbox"/> Over \$100 per month |

Thank you for completing this survey. Please return it today to _____.

SAMPLE KIOSK

10 FACTS ABOUT THE ALTERNATIVE COMMUTE PROGRAM

1. **FREE Guaranteed Ride Home Program** is available to 22,000 transit users in the Washington Metropolitan Area. For more information, visit www.wmata.com/commute.
2. **Transit & Vanpool Subsidies** help offset the cost of transit and vanpooling. For more information, visit www.wmata.com/commute.
3. **Monthly Guaranteed Ride Home** is available to 22,000 transit users in the Washington Metropolitan Area. For more information, visit www.wmata.com/commute.
4. **FREE Bicycles** are available to 22,000 transit users in the Washington Metropolitan Area. For more information, visit www.wmata.com/commute.
5. **FREE Bicycles** are available to 22,000 transit users in the Washington Metropolitan Area. For more information, visit www.wmata.com/commute.
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10. **FREE Bicycles** are available to 22,000 transit users in the Washington Metropolitan Area. For more information, visit www.wmata.com/commute.

STOP!

CONSIDER AN ALTERNATIVE COMMUTE OPTION

- 1. 80% TRANSIT & VANPOOL SUBSIDIES**
Monthly transit and vanpool subsidies are available to 22,000 transit users in the Washington Metropolitan Area. For more information, visit www.wmata.com/commute.
- 2. ONPARK TRANSIT**
12 transit routes within the Washington Metropolitan Area offer on-park transit. For more information, visit www.wmata.com/commute.
- 3. CONVERT AT A TRANSIT/BIKE SALES**
Purchase 12 bikes at 50% off the retail price. For more information, visit www.wmata.com/commute.
- 4. FREE GUARANTEED RIDE HOME**
Monthly guaranteed ride home program is available to 22,000 transit users in the Washington Metropolitan Area. For more information, visit www.wmata.com/commute.
- 5. FREE BICYCLES**
Free bicycles are available to 22,000 transit users in the Washington Metropolitan Area. For more information, visit www.wmata.com/commute.
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- 9. FREE BICYCLES**
Free bicycles are available to 22,000 transit users in the Washington Metropolitan Area. For more information, visit www.wmata.com/commute.

TRY TRANSIT!

Free Trial Transit Passes

For more information, visit www.wmata.com/commute.

80% TRANSIT & VANPOOL SUBSIDIES

Monthly transit and vanpool subsidies are available to 22,000 transit users in the Washington Metropolitan Area. For more information, visit www.wmata.com/commute.

ONPARK TRANSIT

12 transit routes within the Washington Metropolitan Area offer on-park transit. For more information, visit www.wmata.com/commute.

CONVERT AT A TRANSIT/BIKE SALES

Purchase 12 bikes at 50% off the retail price. For more information, visit www.wmata.com/commute.

FREE GUARANTEED RIDE HOME

Monthly guaranteed ride home program is available to 22,000 transit users in the Washington Metropolitan Area. For more information, visit www.wmata.com/commute.

FREE BICYCLES

Free bicycles are available to 22,000 transit users in the Washington Metropolitan Area. For more information, visit www.wmata.com/commute.

Save the Date!

TRANSPORTATION FAIR

Wednesday, July 9, 2003
Courtyard between Raven Ho and Tolantik
10:30 a.m. to 12:30 p.m.

Learn about and try out the latest in transit, vanpooling, and bicycling.

Transit • Vanpool • Bicycle • Walk • Food • Air Quality

Free food and refreshments. Free admission.

TRY TRANSIT!

Free Trial Transit Passes

For more information, visit www.wmata.com/commute.

80% TRANSIT & VANPOOL SUBSIDIES

Monthly transit and vanpool subsidies are available to 22,000 transit users in the Washington Metropolitan Area. For more information, visit www.wmata.com/commute.

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FREE BICYCLES

Free bicycles are available to 22,000 transit users in the Washington Metropolitan Area. For more information, visit www.wmata.com/commute.

Bicycle Commute Guide

For more information, visit www.wmata.com/commute.

Rideshare Guide

For more information, visit www.wmata.com/commute.

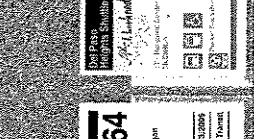
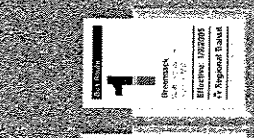
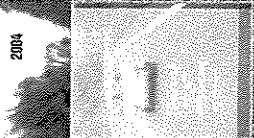
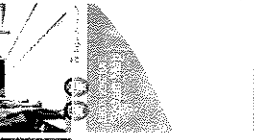


Your Driving Costs 2004

For more information, visit www.wmata.com/commute.

Rideshare Your Commute To Work

For more information, visit www.wmata.com/commute.



APPENDIX F

AIR QUALITY HEALTH RISK ASSESSMENT

DRAFT

Health Risk Assessment for the Proposed Greenbriar Farms Development

October 4, 2005

Summary

The California Air Resource Board's (CARB's) guidance document entitled "Air Quality and Land Use Handbook: A Community Health Perspective¹," recommends, among other things, that new residences should not be sited within 500 feet of a freeway. This recommendation was based on analyses suggesting that health risks were increased within 300 feet of a freeway, and that a 70% reduction in ambient particulate levels is seen at 500 feet from the source. As a consequence, a site-specific health risk assessment was performed for the Greenbriar Farms development project, which entails the proposed construction of residences within about 200 feet of Interstate 5 (I-5) and State Route 99 (SR-99) where the two freeways intersect in northern Sacramento.

The analysis of the potential health risks associated with the impact of freeway emissions on the proposed Greenbriar Farms development was prepared based on CARB and U.S. Environmental Protection Agency (EPA) emission factors, EPA dispersion models, and traffic data provided by the Sacramento Area Council of Governments (SACOG). This analysis indicates that risks from nearby I-5, SR-99, and the freeway interchange on proposed residences in the Greenbriar Farms development are lower than those suggested in CARB's land use guidance document. For the residences nearest the freeways, the acute and chronic non-cancer health risks are below all established regulatory significance levels, and the 70-year average increased cancer risk is less than 6% of recent background risk levels attributable to toxic air pollutants in the Sacramento area.

The lower risks identified for this project, in comparison with the values presented in the CARB Land Use Guidance document, are the result of a number of site-specific factors, including vehicle traffic volumes, the relative orientation of the freeway vis-à-vis the proposed development, local meteorology, and the expected decline in vehicle emissions over time. Notwithstanding the fact that these impacts are substantially lower than those upon which CARB's siting recommendations are based, if additional mitigation measures are desired, the following measures should be considered:

- Use of sound walls to enhance the dispersion of emissions from freeways; and
- Use of tiered tree planting to enhance the dispersion of emissions from freeways.

¹ Published in April 2005.

These two measures are intended to enhance the dispersion of emissions, and hence reduce concentrations of pollutants at residences that are closest to the freeway. Unfortunately, there are no tools available at the present time to quantify the potential benefits of these measures.

Introduction

In April 2005, the California Air Resource Board (CARB) published a guidance document entitled "Air Quality and Land Use Handbook: A Community Health Perspective," which recommended, among other things, that new residences should not be sited within 500 feet of a freeway. This recommendation was based on analyses suggesting that additional health risks were strongest within 300 feet of a freeway and that a 70% reduction in ambient particulate levels is seen at 500 feet from the source. The CARB recommendation directly affects the proposed Greenbriar Farms development, which entails the proposed construction of residences within about 200 feet of the freeway edges. Figure 1 shows a map of the proposed development site adjacent to the intersection of Interstate 5 (I-5) and State Route 99 (SR-99), along with the typical wind patterns in the area based on historical meteorology. As shown in the wind rose plot, the winds are strongest from the south and southwest. This would effectively minimize the exposure of the proposed site to emissions from SR-99 and the interchange; however, emissions from I-5 would be directed towards the proposed development under prevailing wind conditions. A site-specific health risk assessment was performed in order to quantify the risk associated with the combination of meteorology and traffic volumes from the adjacent freeways, including I-5, SR-99, and the interchange.

To assess the risk associated with exposure to mobile source air toxics (MSATs) emitted from vehicles on the freeways adjacent to the development, vehicle emissions on the freeways segments were quantified and the cancer and non-cancer risks due to exposure were estimated at various distances from I-5, SR-99, and the interchange using dispersion modeling. The MSATs included in the study are the 21 toxic air pollutants identified by the U.S. Environmental Protection Agency (EPA)² and listed in Table 1. The analysis was performed for calendar year 2007 and every five years thereafter until 2037 using projected emission rates and traffic activity on the given stretch of freeway. This report summarizes the traffic data and methodology used and the results of the assessment.

² "List of Mobile Source Air Toxics (MSATs)," U.S. Environmental Protection Agency, Mobile Source Air Toxics Website, <http://www.epa.gov/otaq/toxics.htm>, Accessed July 26, 2005.

Figure 1
Greenbriar Farms Development Site Map And Wind Direction

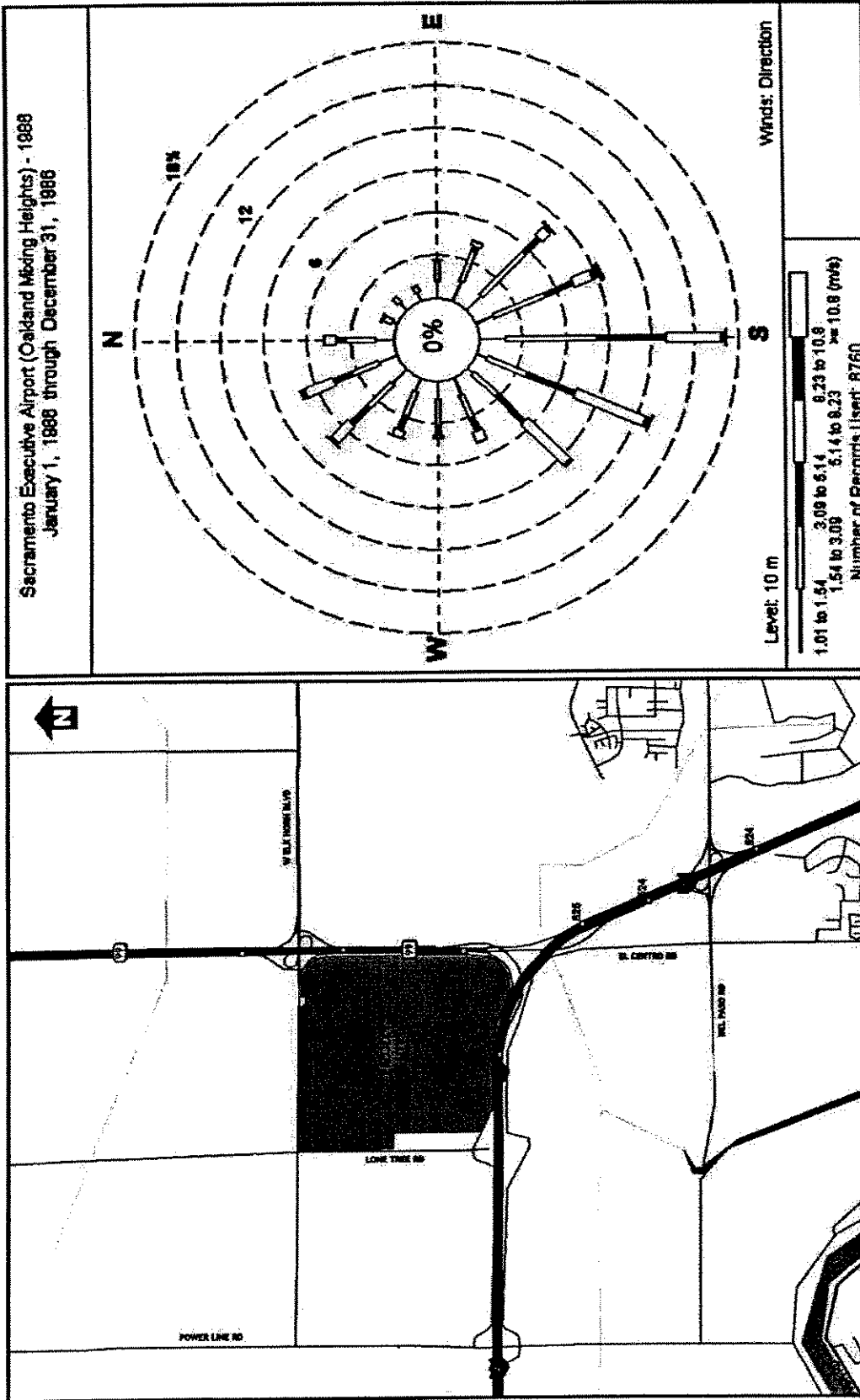


Table 1 21 Mobile Source Air Toxic Pollutants Identified by EPA		
Acetaldehyde	Diesel Particulate Matter (PM) and Diesel Exhaust	MTBE
Acrolein	Organic Gases	Naphthalene
Arsenic Compounds	Formaldehyde	Nickel Compounds
Benzene	n-Hexane	Polycyclic Organic Matter (POM)
1,3-Butadiene	Lead Compounds	Styrene
Chromium Compounds	Manganese Compounds	Toluene
Dioxins/Furans	Mercury Compounds	Xylene
Ethylbenzene		

Estimating MSAT Emission Levels

To be consistent with the development timeline, the analysis years were chosen to begin in 2007, and were projected as far into the future as the emissions modeling would permit at five-year increments to 2037. CARB's most current version of the EMFAC emissions inventory model³ was used as the basis for the analysis; this model projects emissions through calendar year 2040. The EMFAC model has the capability to estimate emissions of hydrocarbons (in the form of total organic gases [TOG] and reactive organic gases [ROG], among others) and particulate matter greater than 10 microns in diameter (PM₁₀) from gasoline and Diesel vehicles specifically for Sacramento County.

EMFAC runs were developed to generate average TOG, ROG, and PM₁₀ emission factors in grams per mile for Sacramento County for each of the 13 vehicle classes in the model, by technology group (non-catalyst, catalyst, and Diesel), for a total of 39 combinations. Because the EMFAC model does not estimate MSAT emissions, the emission factors generated from the model runs were multiplied by air toxic pollutant emission ratios (expressed as MSAT/TOG, MSAT/volatile organic compounds (VOC), and MSAT/PM₁₀) from EPA. For example,

$$\text{MSAT (g/mi)} = \text{TOG (g/mi)} * \text{MSAT/TOG.}$$

The most current version of EPA's MOBILE model⁴ provides ratios to estimate emissions for benzene, 1,3-butadiene, formaldehyde, acetaldehyde, acrolein, and MTBE from TOG emissions and average fuel properties. The fuel used in Sacramento County for 2007 through 2037 was assumed to fall within the requirements of the California Phase 3 Reformulated Gasoline flat limits, and the winter fuel Reid vapor pressure (RVP) was estimated to be 13 psi based on historical winter gasoline in the area.

³ EMFAC2002 dated April 21, 2003.

⁴ MOBILE6.2 dated September 24, 2003.

In addition to the six MSATs explicitly modeled in MOBILE, emissions for dioxins, naphthalene, ethylbenzene, n-hexane, styrene, toluene, xylene, a representative group of POMs,⁵ chromium (Cr⁶⁺ and Cr³⁺), manganese, nickel, mercury, and arsenic were estimated using ratios and emissions factors developed by EPA for use in creating the 2002 National Emissions Inventory (NEI). The ratios for naphthalene, ethylbenzene, n-hexane, styrene, toluene, and xylene from the NEI were based on VOC emissions, the POM ratios were based on the PM₁₀ emissions, and emission factors in milligrams per mile were obtained for the metals and dioxins⁶. Because the EMFAC model does not generate hydrocarbon emissions as VOC, the model emissions for ROG were used with the VOC-based ratios.⁷

After MSAT emission factors were developed for each vehicle class from the combination of the TOG, ROG, or PM₁₀ emissions from EMFAC, and ratios and emission factors from EPA, separate Diesel and gasoline fleet-average MSAT emission factors were estimated using the fraction of vehicle miles traveled (VMT) by vehicle class in EMFAC for Sacramento County for each analysis year. The average gasoline and Diesel MSAT emission factors were then combined with the estimated average annual and peak period total VMT for each fuel type for the adjacent freeways for the study years using the following equation:

$$\text{MSAT (g/mi)} * \text{VMT (mi/s)} = \text{MSAT (g/s)}$$

The VMT (the product of roadway length and traffic volume) for vehicles traveling on I-5, SR-99, and the interchange were estimated from local traffic volume data derived from the Sacramento Regional Travel Demand Model (SACMET) and obtained from the Sacramento Area Council of Governments (SACOG)⁸ and freeway segment lengths estimated to affect the proposed Greenbriar Farms development. The SACOG traffic volume data included the annual average and 3-hour AM peak-period traffic volumes for the north (west) and southbound (eastbound) portions of I-5, the north and southbound portions of SR-99, and the interchange⁹ for 2005, along with the volume projections for 2027. The freeway segment lengths selected were based on the length of the freeway adjacent to the proposed development plus an additional 1,000 feet in all directions¹⁰ in order to ensure that all emissions with potential to result in near-field impacts to the development were captured. This resulted in about two miles of I-5, one mile of SR-99,

⁵ A group of seven polynuclear aromatic hydrocarbons (7-PAH)—benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenz(ah)anthracene, and indeno(1,2,3-cd)pyrene—was used as a surrogate for the larger group of POM compounds.

⁶ No health risk factors were available for furans; therefore, emission factors for furans were not sought beyond the EPA sources referenced.

⁷ The differences between VOC and ROG are believed to be insignificant in the context of this analysis.

⁸ Robert McCrary, SACOG. Personal communication. September 2005.

⁹ 2005 and projected 2027 traffic volumes were obtained from SACOG for the northbound SR-99 freeway ramps from I-5 and for the southbound I-5 freeway ramps from SR-99. Traffic volumes for the other interchanges (northbound SR-99 freeway ramps from I-5) and interchange through traffic (vehicles continuing down I-5 north and southbound past the SR-99 interchange) were estimated from a traffic volume balance over the entire interchange system since all traffic is conserved within the two freeways.

¹⁰ The freeway segments adjacent to the development were extended by 1,000 feet west and 1,000 feet southeast for I-5 and 1,000 feet north for SR-99.

and more than three miles of interchange connectors being included in the freeway system analyzed. The resulting VMT for I-5, SR-99 and the interchange were combined to result in the total VMT for the freeway system for each data year (2005 and 2027). The data were interpolated to develop VMT estimates for 2007, 2012, 2017, and 2022 and extrapolated for travel estimates for 2032 and 2037. The total VMT estimates for the entire freeway system are shown in Table 2.

Calendar Year	Annual Average		Peak Period	
	VMT/Hour	VMT/Sec	VMT/Hour	VMT/Sec
2007	9,466	2.63	17,338	4.82
2012	10,087	2.80	18,300	5.08
2017	10,707	2.97	19,261	5.35
2022	11,328	3.15	20,222	5.62
2027	11,949	3.32	21,183	5.88
2032	12,570	3.49	22,144	6.15
2037	13,190	3.66	23,105	6.42

To generate fuel-specific VMT, the total yearly VMT shown in Table 2 were multiplied by the VMT fraction for gasoline and Diesel vehicles derived from the EMFAC model. The fuel-specific VMT were used along with the gasoline and Diesel average MSAT emission factors in the equation shown above to result in MSAT emissions by fuel type in grams per second. The resulting gram-per-second MSAT emission levels were then combined with the cancer and non-cancer risk factors (in per microgram/meter³ or $\mu\text{g}/\text{m}^3$) to generate emissions-weighted risk per $1 \mu\text{g}/\text{m}^3$ per gram/second.

Cancer risk factors and acute and chronic risk health hazard indices (HHIs) were generated using CARB's Hotspots Analysis and Reporting Program (HARP).¹¹ Risk factors for the MSATs from gasoline-powered vehicles were weighted separately by multiplying the pollutant emission level by the cancer risk factors and HHIs for each individual MSAT. The cancer risk factors and chronic risk HHIs were weighted using the pollutant emission levels generated from the annual average traffic volumes on the freeway system, whereas the acute risk HHIs were weighted using the emission levels during the peak traffic hour. The resulting products were then summed for all MSATs to result in the total risk for gasoline vehicles. For Diesel-powered vehicles, the Diesel PM risk factor in HARP includes all of the MSATs from Diesel exhaust, so only the Diesel PM emission rate and the Diesel PM cancer risk factor were used to account for all of the toxic risk from Diesel exhaust. As with gasoline vehicles, the Diesel cancer risk factor

¹¹ HARP version 1.0 with update 230221 and update to the health and pollutant tables dated September 21, 2004.

and chronic risk HHI were weighted using the annual average traffic emission levels. No acute non-cancer risk HHI is available for Diesel vehicles from HARP.

Dispersion Modeling

The dispersion model used in the analysis is EPA's CAL3QHCR model,¹² which is designed to predict pollutant concentrations near roadways. Unit impacts (assuming a total of 1 gram per second is emitted by all the freeway segments) were generated by the model runs for each calendar year at different distances from the freeway. These unit impacts were then combined with the emissions-weighted risk values generated above to estimate the overall impacts of the freeway traffic emissions. The modeling procedure is described in more detail below.

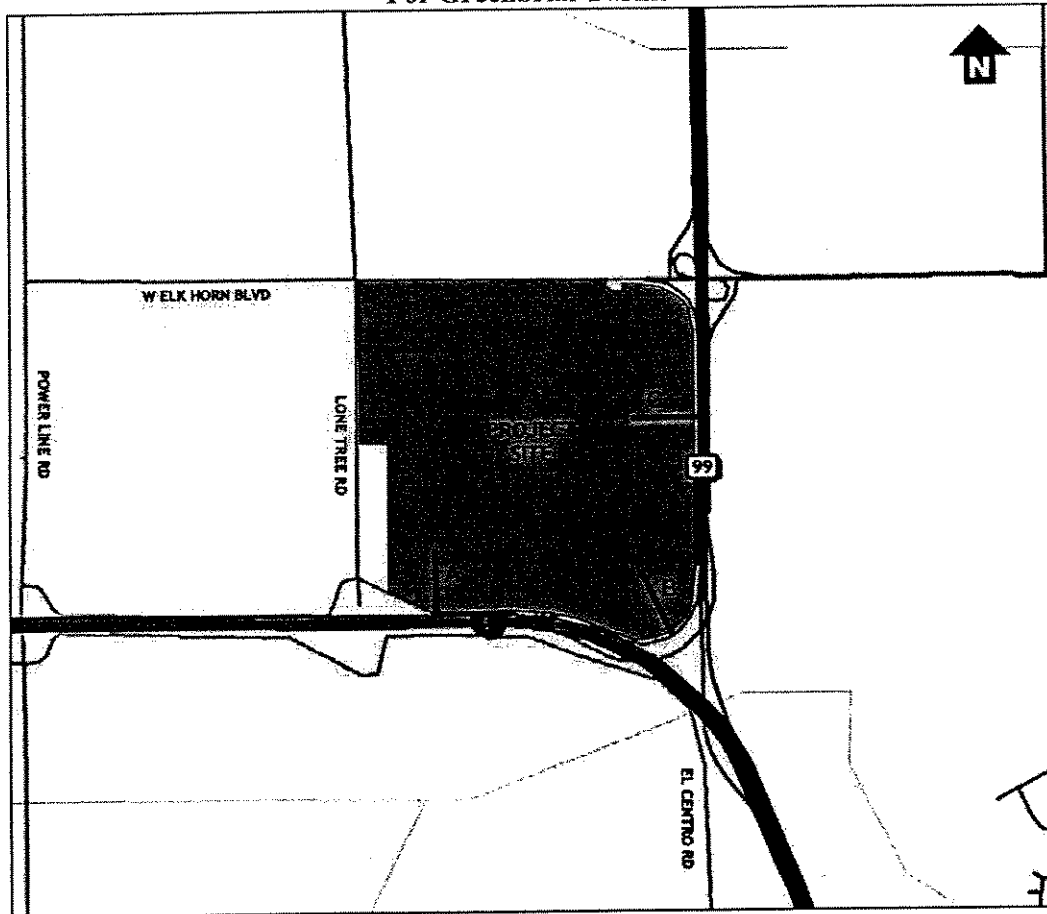
Fifty freeway segments were modeled, all associated with the I-5/Highway 99 interchange. The emission factor for each segment was adjusted, reflecting changing traffic volumes with time, so that the total emission rate from the I-5, SR-99 and the interchange equaled 1.0 gram per second for each scenario year. The number of lanes modeled was derived from SACOG link attributes where available, and supplemented by aerial photos of the interchange. Each lane was assumed to be a standard 12 feet in width. The traffic volumes for the runs were based on the volumes on each freeway segment obtained from SACOG.¹³ Freeway dimensions were taken from the DeLorme Road Atlas software and imported into the TOPO! software map to generate UTM coordinates (NAD27). The two segment sources were modeled following CAL3QHCR's standard line source/mixing zone approach. Meteorological data collected in 1986 at Sacramento Executive Airport were used for the dispersion modeling. Meteorological differences between the Airport and the project site are not likely to significantly affect the reported results.

Three rows of 33 receptors each were modeled (for a total of 99 receptors), with each row extending 300 meters into the housing development. Receptor rows were modeled perpendicular to I-5, SR-99, and the interchange roadway segments, from midway along each segment. The location of the receptors relative to the freeway segments and the Greenbriar Farms developments is shown in Figure 2. In general, the receptors were spaced at 10-meter intervals, starting with the first receptor at the edge of the mixing zone (the boundary of which is defined as 10 feet past the edge of the freeway/traveled way). Two additional receptors were placed in each receptor row at the distances where the edges of the project development and the nearest residential property are estimated to be. The distances between the nearest residential property and I-5, SR-99, and the interchange were estimated using the tentative subdivision map for Greenbriar Farms and aerial photos of the site. The receptor flagpole height was set at the standard 1.8 meters (breathing height) for all CAL3QHCR runs.

¹² CAL3QHCR version dated September 7, 2004

¹³ Traffic volumes on each segment (north and southbound I-5, north and southbound SR-99 and interchange connectors) are inputs to the model to account for the emissions dispersion attributable to moving vehicles on the roadway.

Figure 2
Location of Dispersion Modeling Receptors (Rows A, B and C)
For Greenbriar Farms



Health Risk Assessment Results

The cancer and non-cancer risks associated with freeway emissions were estimated for the range of distances from 0 to 300 meters from the edge of the mixing zone (i.e., from 10 to 994 feet from edge of freeway traveled way) of each freeway segment extending into the development, as shown in the receptor map in Figure 2, for each analysis year. In addition, the 70-year average impacts were estimated by assuming that the results for 2007 through 2032 represent the average for the given year and the subsequent four years, and that the results for 2037 represent the average for that year and the next 40 years. This represents a very conservative assumption for the 70-year average, since the cancer and non-cancer risks from vehicle sources tend to decrease with time.

Both the chronic and acute non-cancer risk indices were below the significance level of 1.0 at all distances from the freeway segments and for all years analyzed. The highest acute and chronic non-cancer indices of 0.63 and 0.26 per million, respectively, occur for 2007 at the edge of the I-5 mixing zone (10 feet from the freeway edge). The non-cancer risks at the edge of the SR-99 and interchange mixing zones in 2007 are less at 0.54 and 0.37 per million for acute risk, respectively, and 0.18 and 0.17 per million for chronic risk, respectively. The risk decreases with time and distance from all the freeway segments.

Figure 3, 4, and 5 show the average cancer risk estimated by distance from I-5, SR-99, and the interchange mixing zones, respectively, for 2007, 2037, and the 70-year average. As shown, the estimated average cancer risk is well below the range of relative cancer risk estimated by CARB in its land use handbook. The handbook, which recommends not siting residences within 500 feet of a freeway, estimates a range of relative cancer risk of 300-1,700 chances in a million. The risk values estimated for the proposed Greenbriar Farms development at the nearest residential property line are about 5 to 8 times lower than the low-end of CARB's range in 2007 and 13 to 15 times lower than the low end of the range in 2037.

In Table 3, the 2007, 2037, and 70-year average cancer risks for the project are presented as a percentage of the 2000 total average cancer risk estimated by CARB for the Sacramento Valley Air Basin. CARB estimated the average basin cancer risk due to air toxics to be 520 per million as part of "The California Almanac of Emissions and Air Quality - 2005 Edition."¹⁴ The estimated basin risk takes into account emissions of 10 select toxic air contaminants¹⁵ (those that pose the greatest health risk in California based primarily on ambient air quality data) from all sources. Therefore, the actual total average basin risk would be higher when all air toxic pollutants are accounted for, and the percentages shown in the table would be lower. These data indicate that, at the property line for the residences that are nearest to the freeways, the 70-year average incremental cancer risk for the project is less than 6% of recent background levels.

¹⁴ <http://www.arb.ca.gov/aqd/almanac/almanac05/almanac05.htm>

¹⁵ The selected 10 toxic air contaminants are acetaldehyde, benzene, 1,3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and Diesel particulate matter.

Figure 3
Average Cancer Risk By Distance From I-5 Mixing Zone Edge

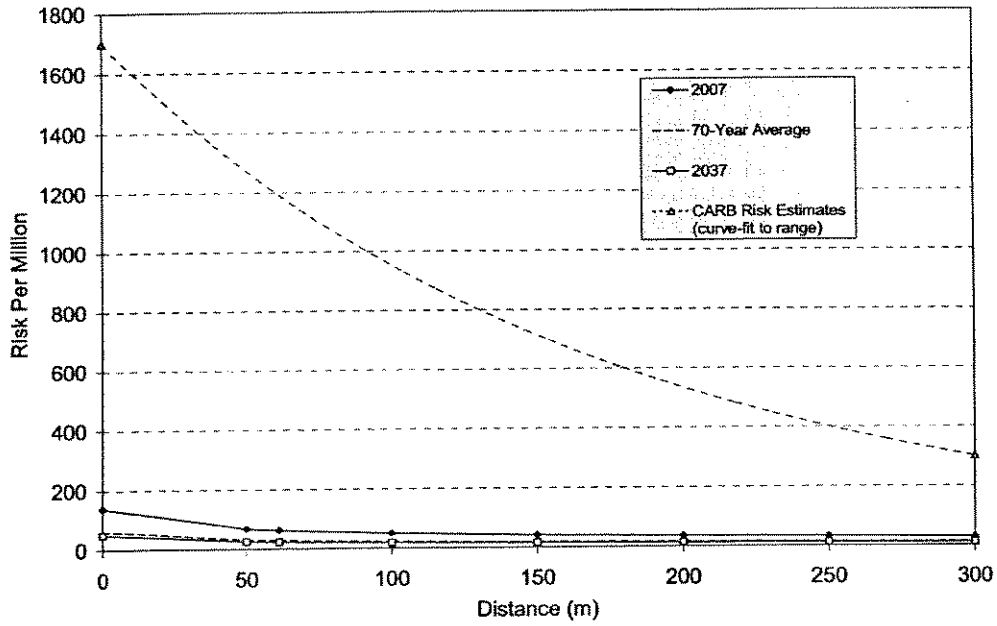


Figure 4
Average Cancer Risk By Distance From SR-99 Mixing Zone Edge

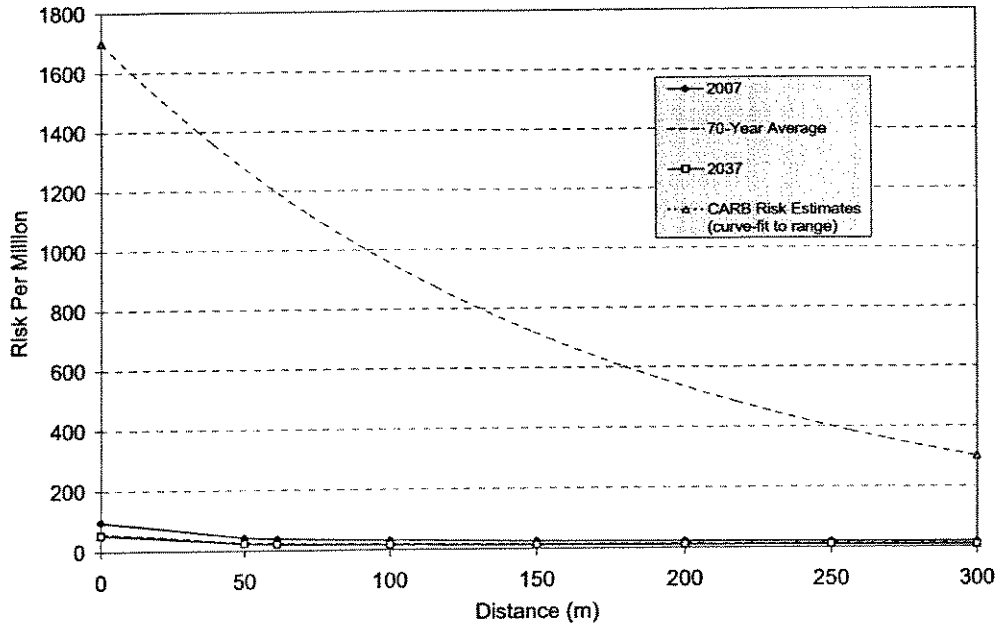


Figure 5
Average Cancer Risk By Distance From I-5/SR-99 Interchange
Mixing Zone Edge

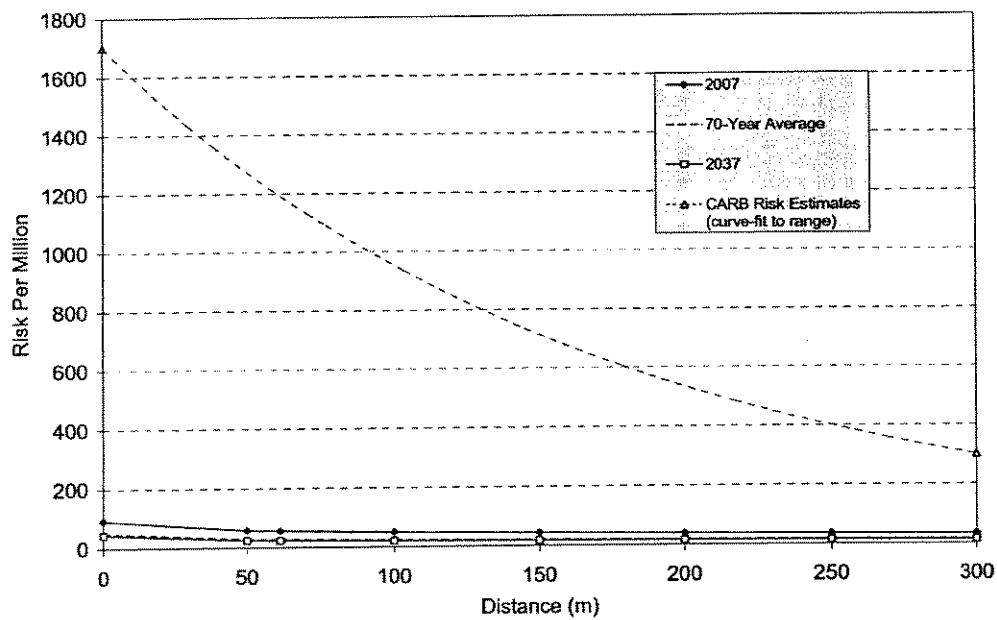


Table 3			
Cancer Risk As % of 2000 Total Average Risk for the Sacramento Valley Air Basin			
Meters from I-5 Mixing Zone Edge	% Of Basin Background Risk by Distance/Calendar Year		
	2007	2037	70-Yr Average
0	26.6%	9.6%	12.0%
50	13.2%	4.8%	6.0%
61.4*	12.2%*	4.4%*	5.5%*
100	9.8%	3.6%	4.5%
150	8.0%	2.9%	3.7%
200	7.0%	2.6%	3.2%
250	6.2%	2.3%	2.9%
300	5.6%	2.1%	2.6%
Meters from SR-99 Mixing Zone Edge	2007	2037	70-Yr Average
0	18.5%	10.3%	11.3%
50	8.2%	4.4%	4.9%
63.8*	7.4%*	3.9%*	4.4%*
100	6.0%	3.1%	3.5%
150	4.9%	2.5%	2.8%
200	4.3%	2.1%	2.4%
250	3.9%	1.9%	2.1%
300	3.6%	1.7%	1.9%
Meters from Interchange Mixing Zone Edge	2007	2037	70-Yr Average
0	17.7%	8.6%	9.8%
50	11.2%	4.6%	5.5%
59.3*	10.8%*	4.4%*	5.3%*
100	9.6%	3.9%	4.7%
150	8.4%	3.4%	4.1%
200	7.6%	3.0%	3.7%
250	6.9%	2.8%	3.4%
300	6.4%	2.6%	3.1%

* Location of property line for residences nearest to freeway segment

Conclusions and Recommendations

A site-specific analysis of the potential health risks associated with the impact of freeway emissions on the proposed Greenbriar Farms development indicates that risks are lower than those suggested in CARB's land use guidance document. This is the result of a number of factors, including vehicle traffic volumes, the relative orientation of the freeway vis-à-vis the proposed development, local meteorology, and the expected decline in vehicle emissions over time. Notwithstanding the fact that these impacts are substantially lower than those upon which CARB's siting recommendations are based, if additional mitigation measures are desired the following measures should be considered:

- Use of sound walls to enhance the dispersion of emissions from freeways; and
- Use of tiered tree-planting to enhance the dispersion of emissions from freeways.

These two measures are intended to enhance the dispersion of emissions, and hence reduce concentrations of pollutants at residences that are closest to the freeway. Unfortunately, there are no tools available at the present time to quantify the potential benefits of these measures.